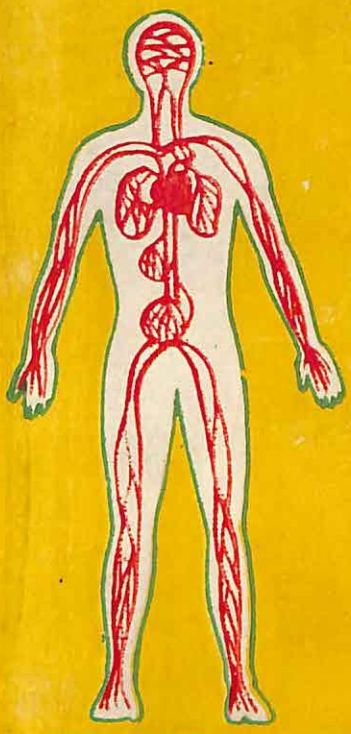
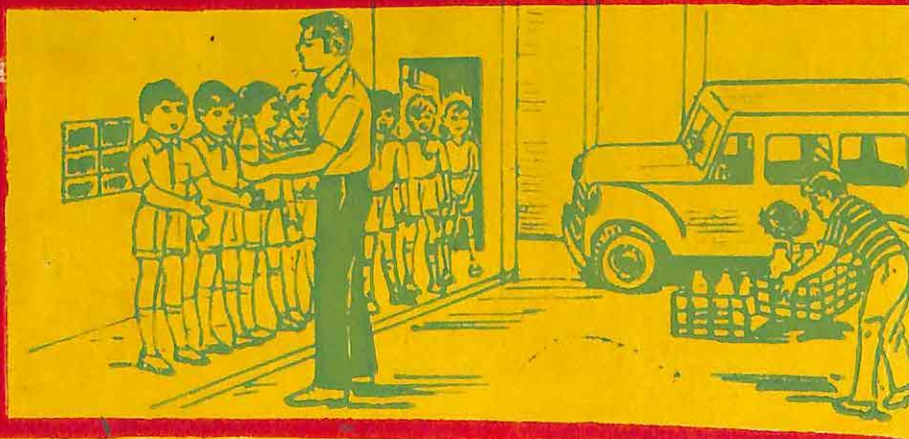


ELEMENTS OF HEALTH EDUCATION



Based on the new syllabus of Central Board of Secondary Education, New Delhi for Secondary School Examination 1989, and onwards under the 10+2 year pattern.

ELEMENTS OF HEALTH EDUCATION

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FOREWORD

A systematic study of health—its principles and problems is a vitally important subject for everybody. Its importance and urgency has increased in the modern age—Age of science and technology which, inspite of creating better living conditions, has exposed humanity to innumerable health hazards. It is, therefore, only proper that the study of health—its principles and problems be included in the school curriculum to make the citizens of tomorrow aware of factors affecting health, and the principles of maintaining sound health.

It is heartening to note that the Central Board of Secondary Education, New Delhi has included *Physical and Health Education* as a compulsory subject for Secondary School Examination under the new 10+2 year scheme ; yet there is hardly any good book suitable for beginners, on this important subject.

ELEMENTS OF HEALTH EDUCATION by Mrs. N. Kapur and Mrs. M. Baliga and published by M/s Pitambar Publishing Co., New Delhi is a commendable effort towards fulfilling this need. The book is written in a simple and lucid style. I have no doubt that the students and teachers as well as the curious general reader, will find the book quite useful and interesting.

P.C. CHOWDHARY

PREFACE

The concept of Health according to the World Health Organisation is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Therefore, it is the duty of every individual to maintain himself in good health. This cannot be achieved without adequate knowledge of the rules of the health. In order to achieve this important objective, the Central Board of Secondary Education, New Delhi has introduced Physical and Health Education as a compulsory subject for classes IX and X in the new 10+2 scheme.

Inspite of the immense progress in the fields of Science and Technology, man is still confronted with various problems in the matter of food, sanitation, environmental pollution, health and disease, etc. It is, therefore, imperative that the students of today, who will become the citizens of tomorrow should be better equipped to understand and solve these problems in the years to come.

The present text-book of Health Education, is based on the syllabus prescribed by the Central Board of Secondary Education, New Delhi for the Secondary School Examination, 1979 under the new 10+2 year pattern. It has been written with a view to enable students to get a real insight into the problems on health and their efforts on the harmonious working of the human body. It also deals with the areas of environmental and community health and hygiene. The foremost idea is to impress upon the student that wealth lies in the health of a nation.

The book is also meant to provide teachers with sufficient material to tackle this extensive subject of health education in a systematical and logical manner.

The book is divided into nine units, each unit being made up of a number of chapters. Thus each chapter is a small learning unit capable of being completed in a few lessons. Thought-provoking quotations have been included and each chapter has a summary giving the most salient features. The exercises, activities and projects given at the end of each chapter will help the students to involve themselves in making the process of learning interesting and effective, both inside and outside the precincts of the classroom.

In fact, this book is an attempt to help the individual student to improve his own, the community and environmental health both in the rural and urban areas of the country.

We wish to express our gratitude to Shri P.C. Chowdhary, Principal, The Modern School, New Delhi, who has given very helpful and valuable suggestions during the writing of the book and has also contributed a very encouraging foreword to the book. Our gratitude is also due to Shri Din Dayal, Ex-Principal, Delhi Public School, New Delhi for inspiring us to write this book.

We hope that the students and teachers would find this book useful. Any suggestions from fellow teachers for its improvement will be gratefully received and acknowledged.

—Authors

SYLLABUS IN HEALTH EDUCATION

(For IX & X Classes Under the New Scheme of 10+2)

(A Subject For Internal Assessment)

I. Objectives *(60 Periods)* *50 Marks*

1. To develop a scientific point of view for health with reference to traditional and modern concepts of health.
2. To identify health problems and understand their own role along with role of health and medical agencies; in meeting these problems to take interest in current events related to health.
3. To arrive at suitable conclusions based on scientific knowledge and take actions as individuals, members of a family and community for protecting, maintaining and promoting individual and community health.
4. To set an example of desirable health behaviour to others.

Unit I. Concept of Health and Factors

Influencing Health. Health is a moving target and an ecologic resultant involving the interaction of many factors and conditions.	Meaning, nature and concept of health, inter-dependence of various dimensions of health—physical, social, mental factors affecting health (personal, hereditary and environmental including sociocultural factors and importance of health) for the individual and the community.
Being aware of environmental conditions helps in protecting one's own health.	Environmental conditions in villages and towns in relation to health status of people—waste disposal practices and pollution of air, water and land, compost pits, gobargas plants. Sanitary latrine; sources of drinking water, healthful housing.
Certain practices contribute towards preservation and promotion of individual and community health.	Personal health practices for preservation and promotion of health, personal habits, personal cleanliness including oral and dental hygiene, clothing, rest and exercises, our cultural practices in relation to personal health.
Unit II. Safety, First-Aid, Home Nursing and Civil Defence Knowledge, understanding and intelligent practice of principles of first-aid, home nursing and civil defence may save the lives of those in danger.	Common accidents that occur in home, community and schools. Major accidents which cause deaths in rural and urban areas. Safety rules related to.
Accidents may be prevented by knowing their causes and following safety precautions.	Making fires, using stoves/gas electricity climbing stairs, crossing roads, boarding transport, cycling, swimming, playing, storing poisons and medicines, practising crafts, working in laboratories and using electric gadgets.

Environmental hazards may be removed or reduced.	First-aid measures for cuts, wounds, bleeding, fractures, bites and stings, drowning, fainting, shock and burns. Principles of First-aid, and home nursing and skill in dealing with specific situation (s), Measures to remove environmental hazards.
Unit III. Growth and Development, including physical growth, intellectual advancement, emotional maturity and social responsibility, follows a predictable sequence yet are unique for each individual. In early adolescence the range of individual differences in body development is greater than at any other time.	Review of body structure and functions; Meaning of growth and development, factors influencing growth & development, hereditary factors, effect of endocrine secretions, nutrition, rest, sleep, relaxation, exercise, and disease. Individual differences. Development of children, their special needs especially nutritional needs.
No two people are alike in body built. Differences in growth rates may result in emotional problems. An understanding of the basic structure and function of the body systems provides a background for health maintenance. The young adult reaches maturity with increased independence and greater responsibility.	Review of body structure and functions.
Behaviour gives some evidence that maturity has been reached.	
Differences in individual physical, mental and social growth rates are evident in the young adults.	
Emotions affect body functions. A mature person takes responsibility for own health and the health of others; viewing health as a means to an end and not an end in itself.	
Unit IV. A variety of factors emerging from physical, economic and sociocultural environment of individuals may be responsible for mal and under nutrition of people leading to bad health and disturbed family life affecting national prosperity. Adequate nutrition is important in adolescence to provide for rapid growth and increased physical activity.	Factors affecting nutritional status of an individual—Heredity, Environment (Physical religious, sociocultural and emotional conditions). Family economy Rest, sleep and relaxation Nutritional needs of body calories and nutritive components (carbohydrates, proteins, fats, vitamins, minerals and water), cheap and locally available sources rich in these nutrients.
Nutritive values as well as cost is important to be considered when buying foods.	Nutritive values of commonly used food stuffs

Foods of equal cost may be different in nutritive value. Caloric and nutritive requirements provide a base for appraising daily food intake.

Balanced diet, its importance and requirements according to age, sex, occupation, pregnancy and location (with special emphasis on requirements of adolescents).

Unit V. Health Hazards of Modern Age. Technological developments besides improving the quality of life have also created a number of health hazards and population explosion has further accentuated them.

Deficiency diseases.

Technological development factors. Agricultural transport systems, nuclear power plants etc., and related health hazards; Problem of over-population in relation to the welfare of the family, community and the Role of individual and states in minimizing the hazards.

Unit VI. Communicable and Non-Communicable diseases. While everyone is susceptible to communicable and degenerative diseases, these can be prevented and controlled.

Diseases :
Communicable and non-communicable diseases, Role of agent host and environment in the spread and prevention of disease; minor ailments. Body defences—immunity; natural and acquired, importance of regular medical check-ups (early diagnosis) in prevention of communicable and degenerative diseases. Role of immunization in prevention of specific diseases and immunization schedules for small pox, T.B., Diptheria, Tetanus, Whooping cough, Polio, Cholera, Typhoid and Rabies.

Health morbidity and mortality in our country. National Health Programmes, role of individuals and government in these programmes.

Unit VII. Consumer Education

Medicine and surgery are specialised fields and practice of these by unqualified persons may lead to serious complications and even to dealth. Drugs have played an important part in the spectacular reduction of mortality in recent years.

Elementary knowledge of various systems of medicine prevalent in our country and specializations available. Development of new drugs and their role in controlling the incidence of disease.

Drugs have many effects including "Side effects" on people. The illegal or excessive use of drugs is called drug abuse. Drug abuse is a manifestation of personal inadequacy to deal with various facts of life—the drugs abused today fall into several categories.

Prescription and non-prescription drugs: Habit forming drugs: Tobacco and alcohol. Importance of going to right place and person for health and medical services. Dangers of going to a quack.

One of the serious consequences of drug abuse is drug dependency. Opportunities are varied and many in health careers.

Unit VIII. Health Organization (National and International) Individual, community and state have specific but complementy roles in protection, preservation and promotion of Health.

Medical and Health set up at local, district, state, national and international levels. Voluntary agencies working in the field of health. Role of official and non-official agencies in health protection, preservation and promotion.

SCHEME OF EXAMINATION IN HEALTH EDUCATION

1. Assessment will be internal.
2. Evaluation will be continuous and the schools will maintain a cumulative record of each pupil which would be open to inspection by the authorities of the Board and of the school concerned.
3. The result of internal assessment shall be expressed in terms of grades on a five-point scale given below :

Grade A– Excellent 75% and above

Grade B– Very Good, 60– 74%

Grade C– Good, 53– 59%

Grade D– Average 45– 52%

Grade E– Fair, 33 to 44%

Grade F-Marginal 15% to 32%

Grade G-Poor Below 15%

4. In order to be eligible for the Secondary School Examination at the end of Class X, the student must obtain at least *Grade* E in this subject.
5. The results should be communicated by the schools to the Board at least three weeks before the commencement of the Secondary School Examination. The achievement in the internal assessment will be shown by the Board in its certificate.
6. Marks : 50

CONTENTS

"The processes of teaching and learning stimulate one another."

—Confucius

To

Our Students

who have motivated and inspired us.

"The preservation of health is a duty".

—Spencer.

Concept of Health and Factors Influencing Health

Chapter 1—*Definition and Dimensions of Health.*

Chapter 2—*Factors Affecting Health.*

Chapter 3—*Environmental Conditions in Villages and Towns in Relation to the Health Status of the People.*

Chapter 4—*Personal Health Practices for Preservation and Promotion of Health.*

CHAPTER 1

Definition & Dimensions of Health

An old prescription for health goes like this :

'Great temperance, open air,

Easy labour, little care'.

Good health is a vital part of the great experience of living. The truth of this has been known even from early times. Every age has made new discoveries about health, thereby providing man with new weapons to fight disease. Today, steady progress is being made in the fields of education, medicine and surgery as well as public health. This gives everyone a fair chance to lead a healthier and fuller life. However, people accept something new only if it does not differ too much from their own culture and beliefs, and if they are convinced of its utility. In view of this, it has been found important to include the subject of Health Education in the school curriculum.

Health Education can be defined quite simply as a science which helps boys and girls to acquire the knowledge and practices that result in desirable health behaviour. Through such instruction, the child learns to live in a health manner and to meet the changing situations of life with poise and balance. Thus the school health programme helps to improve the health of the individual and, through the individual, the health of the community and the nation at large.

"The first wealth is health"— *Emerson*

Health is a matter which affects not only each one of us as individuals, but also the community in which we live. Unless an individual keeps fit, he cannot make full use of his life nor can an ailing community play its proper role in the world. Hence the concept of health is vitally important for all of us and perfect health for all is the final aim of every community.

Now what do we understand by the word 'health'? Night and day the different parts of our body are working. If their work goes on smoothly, in tune with the surrounding conditions, then the body is said to be healthy. But if this natural or normal state is upset or something goes wrong with one of the functions of the body, then one becomes ill. The World Health Organization (W.H.O) goes further to define health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

Dimensions of Health

The aim of health education is to consider the various conditions that can affect health so that both the individual and the community may learn to control them. If this is done successfully, ill-health and the unhappiness it causes can be controlled and even prevented. This can be done by consideration of certain factors like (*i*) Physical well-being, (*ii*) Mental and emotional well-being, and (*iii*) Social well-being, (*iv*) Spiritual well-being.

(*i*) *Physical well-being.* It means the correct use of the body mechanism at every stage of life, more so in adult life. In other words, it means physical fitness. This can be brought about, by the right kind of food in sufficient quantities, the right amount of exercise and attention to the rules of health. One should not be satisfied with the mere absence of disease but aim at ensuring complete physical fitness and a sense of well-being.

(*ii*) *Mental and Emotional Well-being.* A happy life with physical well-being and mental poise should be the aim of every body. A mentally depressed person develops physical troubles too, because the mind and the body are closely connected. Thus overwork makes one lose sleep so that the body gets tired. Worry can cause pain in the stomach and prolonged mental stress can lower the body's resistance to disease. For this reason it is very important to keep the mind fit. The mind requires a purpose and if dissatisfied either in a job or any activity, becomes depressed. Everyone should therefore have an occupation or regular activity, which stimulate the mind and a hobby which relaxes it.

Mental health is also influenced by emotions. These are a part and parcel of our character and assert themselves very quickly, sometimes even more so than reason or judgement. Anger, love, hatred and jealousy are some of the emotions. However man's brain has developed and with this, emotions can be controlled. Emotional control

depends on age, training and environment. A mentally healthy person faces life and its problems with confidence and courage, using reason as his guide. He accepts misfortunes and learns from mistakes, gaining wisdom through all his varied experiences.

(*iii*) *Social Well-being.* The progress and welfare of a society or community depends upon the education, health, production and social security that it ensures for its members. These are intended to keep every one free from disease, ignorance and poverty. Education helps one to live as a good citizen. Health enables one to work more and earn more and add to the assets of the nation by the production of more food, clothing, shelter and consumer goods. Social security helps to protect one against misfortunes in life like illness, un employment, handicaps, accident hazards and death. Social security measures include medical care, gratuity, old-age pension, provident fund, life insurance and special schemes in banks and housing. The social well-being of a cammunity can be enhanced by the individuals becoming progressive, broad-minded, considerate, thoughtful and sympathetic towards others.

(*iv*) *Spiritual Well-being.* Due to the stresses and strains of life in modern times, it is very important for us to consider another dimension of health—the spiritual well-being of an individual. He cannot afford to neglect the affairs of the spirit because the spirit is more important than the body. An individual must be at peace with himself before he can, be at peace with the world. Attention to moral values is necessary in order to attain spiritual well-being. In this connection it may be stated that moral hygiene is as important as physical and mental health of an individual.

Summary

This is a brief outline discussing the concept of health and the importance of health education. Health may be defined as a state of complete physical, mental and emotional well-being and not merely the absence of disease or infirmity.

Complete health includes physical fitness along with mental poise and social well-being. A normal healthy body requires the four dimensions of health : physical, mental, social and spiritual. In other words, an individual must have a healthy body and a healthy mind and the society in which he lives must provide him with the necessary social security ; he must also be at peace with himself.

I. Essay Type and Short-Answer Questions

1. Write a suitable definition of health.
2. Name the areas connected with the dimensions of health.
3. What do you understand by physical well-being ?
4. How would you distinguish between mental well-being and social well-being ?
5. What are emotions ? Mention how emotional health can be maintained.
6. Why is social security essential for life ?

II. Objective Type Questions

(*a*) Fill in the blanks with suitable words :

1. Health is a state of complete..... .....and.....well-being and not merely the absence of.....or.....
2. The first wealth is.....
3. The concept of.....is vitally important for all of us.
4. Physical well-being means the correct use of the.....mechanism at every stage of.....
5. A mentally.....person develops .....troubles also because the mind and the.....are closely connected.
6. Mental health is also influenced by .....
7. Everyone should have an occupation that.....the mind and a bobby which..... .....it.
8. Social.....helps to protect one against misfortunes in life.

(*b*) In the following statements put a tick (√) against those you think to be correct and a cross (×) against those you think to be wrong :

1. Good health is a vital part of the great experience of living. ( )
2. When all the systems in the body are working smoothly, the body is said to be healthy. ( )
3. A healthy body and a healthy mind go together. ( )
4. One should be satisfied with the mere absence of disease. ( )
5. Worry and mental stress tone up the body just as exercise tones up the muscles. ( )
6. It is the duty of the state to provide social security for all its citizens. ( )
7. Overwork and fatigue make one loss sleep. ( )

Activities

1. Make a poster for your class using the following extract from WHO constitution.

Fig. 1.1—WHO's Crest

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.

The health of all people is fundamental to the attainment of peace and security and is dependent upon the fullest co-operation of individuals and States.

The achievement of any state in the promotion and protection of health is of value to all.

Unequal development in different countries in the promotion of health and control of disease, especially communicable disease, is a common danger.

Healthy development of the child is of basic importance ; the ability to live harmoniously in a changing total environment is essential to such development.

The extension to all peoples of the benefits of medical, psychological and related knowledge is essential to the fullest attainment of health.

Informed opinion and active co-operation on the part of the public are of utmost

importance in the improvment of the health of the people.

Governments have a responsibility for the health of their peoples which can be fulfilled only by the provision of adequate health and social measures.

—From WHO Constitution

2. Make a poster for your class using the following extract from the Directive Principles of State Policy, as given in the Constitution of India.

सत्यमेव जयते

Fig. 1.2—Crest of the Indian Republic

The State shall, in particular, direct its policy towards securing :

...that the health and strength of workers, men and women, and of the tender age children are not abused and that citizens are not forced by economic necessity to enter avocations unsuited to their age or strength.

...that childhood and youth are protected against exploitation and against moral and material abandonment.

The State shall, within the limits of its economic capacity and development, make effective provision for securing the right to work, to education and to public assistance in cases of unemployment, old age, sickness and disablement, and in other cases of undeserved want.

The State shall make provision for securing just and humane conditions of work and for maternity relief.

The State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties... ..

—From The Directive Principles of State Policy, Constitution of India.

CHAPTER 2

Factors Affecting Health

"Health is the greatest of all possessions :
A sturdy cobbler is better than a
sick King".

Factors Affecting Health

A person's health is his own responsibility. It is essential that we realise the truth of this statement and consider perfect health as a goal to be achieved. Wise and timely attention to health offers a good reward, whereas neglect brings its own punishment.

The health of a person depends partly on himself, partly on heredity and partly also on the way in which he adjusts himself to the demands of his environment.

1. Personal Factor. An individual wishing to live a full and rich life should include the following in his health programme :

(*a*) Wholesome food,
(*b*) Physical activity,
(*c*) Ample sleep,
(*d*) Oral and dental hygiene,
(*e*) Care of feet,
(*f*) Good posture,
(*g*) Suitable occupation,
(*h*) Proper use of leisure,
(*i*) Good mental attitude towards life.

2. **Hereditary Factor.** Our health and constitution are determined partly by heredity and partly by environment. Heredity refers to what we are born with and environment to what we acquire thereafter. Some of us are born with a strong constitution and are thus better able to face the hardships of life, while others are born with a weak constitution and may be, with some physical, mental or emotional handicap—even some hereditary disease. The physical bridge between the parents and their offspring is just the gametes—the egg cell contributed by the mother and the sperm cell by the father. The embryo (young one) develops from the fertilized egg cell formed by the union of the egg with the sperm cell. The nuclei of the gametes (and also of the body cells) contain a fixed number of chromosomes. These chromosomes bear hereditary units of DNA called genes. It is these genes which determine the characters (physical and mental) of

the next generation like colour of the skin, hair, height, body build, intelligence, etc. If the genes are good and normal, the child will be a healthy one if on the other hand, one or more of the genes are defective the child will be born with some actual or potential defect, susceptibility to disease etc. It is all an element of chance and one's luck the type of genes one is born with !

3. **Environmental Factor.** In order to live one must make frequent adjustments to one's environment. Environmental factors are broadly divided into (*a*) Internal and (*b*) External.

(*a*) *Internal Environment* This refers to the conditions inside the human body produced by the working of all the organs and systems. In normal health a state of 'homeostasis' is maintained, this means that the internal environment is maintained at a constant level. The composition of the blood and body fluids is kept at a constant level, the body temperature is kept constant and so on. However during illness and due to various other causes, the internal environment may get disturbed and will have to be brought back to normal with the help of suitable medicines and treatment.

(*b*) *External Environment.* This refers to conditions outside the human body and plays an important part in affecting the internal environment in terms of health and disease.

The external environment can be sub-divided into :

(*i*) *Physical*, which is made up of air, light, temperature, food, water and housing.

(*ii*) *Biological*, which is made up of animals, plants and disease-producing micro-organisms.

(*iii*) *Social*, which consists of the social life of man such as customs, traditions, education, culture, civilization, economics, society, and its organization.

4. **Socio-Cultural Factor.** One of the principles of health education is to make one learn and act according to the social and cultural pattern of life. But each one's outlook differs, depending on his situation and background. In India, superstition still plays a vital part in communal life *e.g.*, if a family believes in the chanting of mantras to cure a snake-bite, no amount of trying will make them was anti-venom instead. Superstitious man is exposed to disease. He believes that illness is caused by evil spirits and offers sacrifices as a cure. As a result of such beliefs, children have died before becoming adults. It is entirely within our capacity to change our habits, social customs and beliefs in order to become healthy and mature.

Summary

Health is one's own responsibility and if cared for, can result in a happy life. Factors which affect health are three-fold :

(*a*) *Personal*. The manner in which good health can be achieved at the personal level is by following the rules of health regularly.

(*b*) *Heredity*. It is another important factor which influences health, both physical and mental.

(*c*) *Environment*. It is the third factor affecting health. The external environment includes the physical, biological and social-factors. The internal environment is maintained at a constant level by the efficient working of the organ systems.

In order to maintain ourselves in good health, we should be prepared to do away with superstitions and change our habits and social customs.

I. Essay Type and Short-Answer Questions

1. Why is health regarded as the greatest of all possessions ?
2. Which are the factors that affect the health of an individual ?

II. Objective Type Questions

(*a*) Fill in the blanks with suitable words :

1. Health is one's own.....
2. External environment includes physical.....and.....factors.
3. In normal health a state of.....is maintained.
4. The physical bridge between the parents and their offspring is just the .....
5. Environmental factors are broadly divided into.....and.....
6. One of the principles of health educatiod is to make one learn and act according to the.....and..... pattern of life.
7. It is the.....that determine the characters of an individual.

(*b*) In the following statements put a tick (√) mark against those you think to be correct and a cross (×) mark against those you think to be wrong :

1. An individual's health programme need not include wholesome food and good posture. ( )
2. In India, superstition still plays a vital role in communal and family life. ( )
3. Wise and timely attention to health offers a good reward. ( )
4. Micro-organisms are a part of the biological environment. ( )
5. During illness the internal environment remains undisturbed. ( )
6. Some of use are born with a weak constitution. ( )
7. Man is unsociable by nature. ( )

Activities

1. Make a list of the "Rules of Health" and illustrate each one of them.

2. Write a class newspaper. In it write out the various health problems faced by the students in your class and mention the steps taken to solve them.

3. List out some common superstitions that you have come across. How can you disprove them ?

4. Try to practise any two of the following for spiritual well-being for about 10-15 minutes in your daily life :

(*a*) Meditation or trying to evoke some good thoughts.

(*b*) Reading some passages from religious books like the *Bhagwad Gita*, the *Ramayana*, the *Bible* or the *Koran*.

(*c*) Reading the lives from the works of Sri Ramakrishna and Swami Vivekananda.

(*d*) Reading through good thoughts for the day.

□

CHAPTER 3

Environmental Conditions in Villages and Towns in Relation to the Health Status of the People

"The plea of ignorance will never take away our responsibilities."

—*Ruskin*

People in the villages or rural areas can lead a healthier life than those living in towns or urban areas because there is fresh air, unadulterated food and an outdoor life. But in the villages there are other problems such as bad housing conditions, improper disposal of waste, impure water supply and absence of proper drainage. These, along with storage of dung heaps close to houses, pose serious health hazards. Flies breed under such insanitary conditions and spread various diseases like cholera, typhoid and dysentery. Mosquitoes breed in the ponds, puddles and drains and spread malaria, elephantiasis, dengue fever, etc.

In our country, a large number of people live in the villages ; so the poor sanitary conditions in rural areas can affect the health of the nation. It should be the duty of each one of us to make the villagers aware of the need for cleanliness fresh air, pure water supply, better housing and proper disposal of wastes or refuse. This can be done through the mass media, the block development officers, health visitors and the village schools. The villagers should be encouraged to get together and solve these very important problems which affect their health.

Sanitary disposal of Faecal matter and other wastes. The best method is the one where faecal matter is not allowed to pollute the water supply, food or soil. All types of wastes including household refuse, cow dung, etc., should be taken to some spot outside the village. This will prevent the bad smell from polluting the air. Each house must dig a pit, 2 metres deep, 3 or 4 metres wide, and as long as required. This is known as a *Compost pit.* Household refuse should be thrown into this pit, fully covered with earth, and then allowed to mature

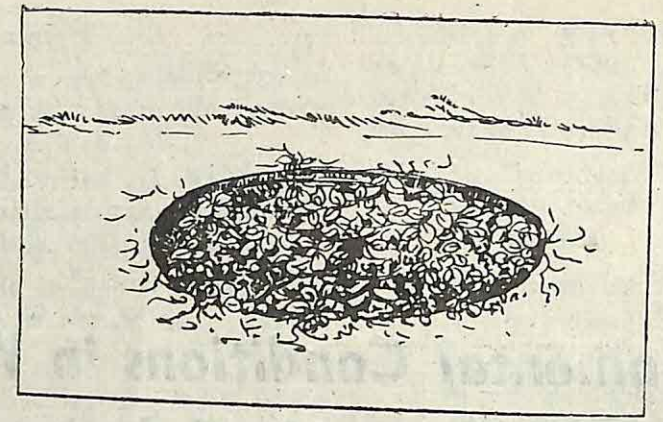


Fig. 3.1—A Compost pit

into manure. The waste matter in a compost pit is changed into *Humus* or *Compost* by the action of bacteria. It is of a high value because of organic matter. When ready, it can be used for the cultivation of crops which would give a high yield.

The Gobar Gas Plant

The only source of domestic fuel for people in our villages so far, has been dung. It has been estimated that about 350 million tons of dung are burnt away every year. This is a serious loss because this quantity of dung could give 175 million tons of processed farmyard manure per year. Scientists from the Indian Agricultural Research Institute at New Delhi have worked on this problem and designed a simple and easy-to-operate gas plant in which dung is fermented to yield a combustible gas. The gas is used as fuel and the dung residue obtained from the plant is utilized as manure. The residue has been found to be richer than the usual farmyard manure due to the removal of its heat constituents in the form of gas. So using the gobar gas plant is of double advantage to the farmer.

Working Principle

The gas plant operates on the simple principle that when dung or any other organic matter is fermented in the absence of air, a combustible gas known as methane is produced. In the gobar gas plant fermentation takes place in a brick-lined well, 3·66 *m* deep and 1·68 *m* wide, which is filled with dung in the form of *slurry*. This is covered with an iron drum 1·52 *m* in diameter and 1·22 *m* in height, introduced upside down into the well which serves to cut off air and provide necessary conditions for fermentation. The gas collects in the inverted drum which begins to float and rise. The gas can be led to the kitchen by pipes through an opening at the top of the drum.

Operation. In the first instance, dung in the form of slurry is introduced in the fermentation well through the funnel until it is completely full. Production of gas normally starts within a week. The

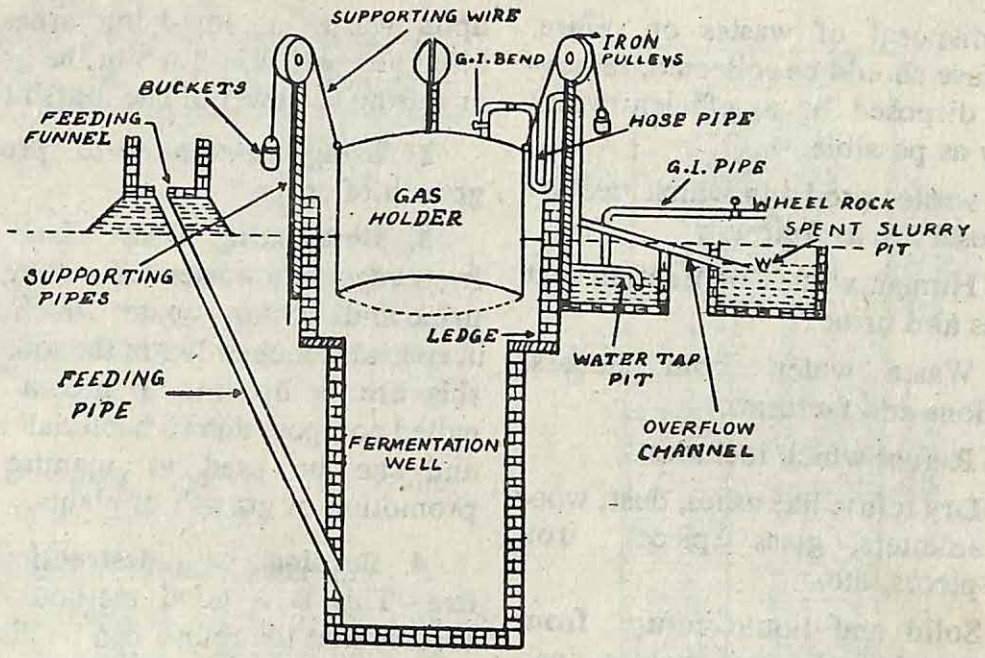


Fig. 3.2—A Village Model of Gas plant designed by I.A.R.I., New Delhi

gas collects inside the holder and causes it to float and rise up with the supporting force of the hanging buckets. When the gas is required for use bricks from the buckets are removed. After the gas has formed, production is maintained by daily feeding of about 45·36 *kg* of dung made into slurry. This produces, about 2·83 m^3 of gas per day which is sufficient for the cooking requirements of a family. The digested slurry which overflows daily from the top of the well collects in the pit from which it is removed to a compost pit. The gas drum needs to be taken out occasionally for cleaning and given a coating of paint once a year.

Uses

1. **Cooking.** The gas can be used as a fuel for cooking through suitable burners. I. A. R. I. has designed cheap and simple burners for gobar gas which can be easily fabricated by the farmers themselves.

2. **Lighting.** The gas can also be used for lighting purposes for which suitable lamps are obtainable.

3. **Power.** The composition of the gas obtained from the plant is about 60% methane, 30% carbon dioxide and 10% hydrogen. The mixtue can be directly used for operating usual types of petrol or kerosene engines. The power generated can be used for running water pumps, chaff cutting machines, flour grinding mills, electric dynamos or for any other purpose.

Disposal of Refuse

The most important health problem faced by any settled family or community whether in a village, town or city

is the disposal of wastes or refuse. This refuse should be collected, removed and disposed of as efficiently and speedily as possible.

The wastes products which required disposal are as follows :

(*a*) Human wastes or Excreta that is faeces and urine.

(*b*) Waste water from houses, institutions and factories.

(*c*) Refuse which includes :

1. Dry refuse like ashes, dust, wood splinters, glass pieces, iron pieces, etc.
2. Solid and liquid refuse from slaughter houses, stables, cow-sheds.
3. Street sweeping—such as paper, cigarettes, glass bits, horse and cow dung, etc.
4. Garbage-leaves. vegetables, rotten fruits, kitchen waste, etc.

People living in villages or rural areas have to deal with their own house refuse. This can be done by the following ways :

1. **Dumping**—Depositing the wastes upon waste in low-lying areas and filling up pits or hollows in the ground or raising the level of the marsh lands.

2. **Using as manure** to promote growth of crops.

3. **Composting**—This is made from vegetable wastes cow-dung, cow urine and human wastes which is put in special trenches dug in the soil. Later this breaks up into a brown mass called compost due to bacterial action and can be used as manure for promotion of growth of plants.

4. **Burning or destruction by fire**—This is a good method for it ensures that the refuse can be disposed of daily by mixing it with dry leaves or wood.

In towns and cities the house, refuse street sweepings are collected and removed by the Municipal or Corporation authorities. The house refuse should be put into special covered metal dust-bins. These should be rat-proof and fly-proof and should have small holes at the bottom for drainage. The refuse should be collected every day if possible and

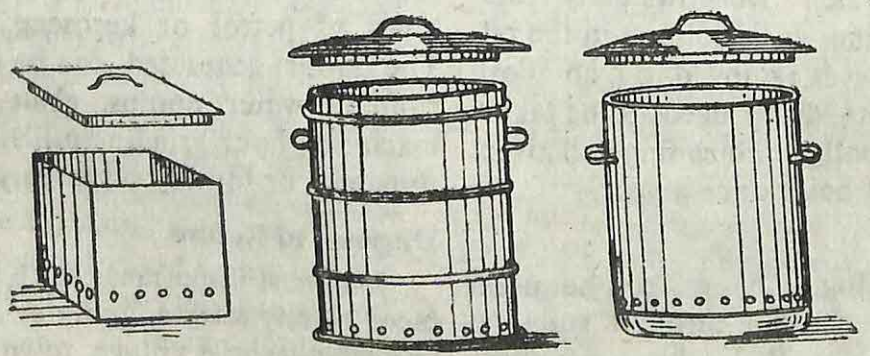


Fig. 3.3—Kinds of dust-bins

emptied into covered carts or lorries. The refuse after collection should be disposed of as speedily as possible either by (*a*) Burning and (*b*) Dumping.

(*a*) **Burning**—In this method the refuse is made harmless by first drying it for a few hours before it is set on fire in specially designed structures known as an Incinerator or refuse destructor.

(*b*) **Dumping**—This is the same method as used in villages.

The Disposal of Human Excreta

There are several ways for the safe disposal of human excreta both in rural and urban areas. These depend upon the living conditions obtainable in the particular area.

A Sanitary Latrine

In the rural areas the *Bore Hole Latrine* is the best type of latrine. It is made up of a round hole 40 to 45 cm in diameter and sunk to a depth of 6 to 7 m under the ground until the surface of the sub-soil water is reached. The

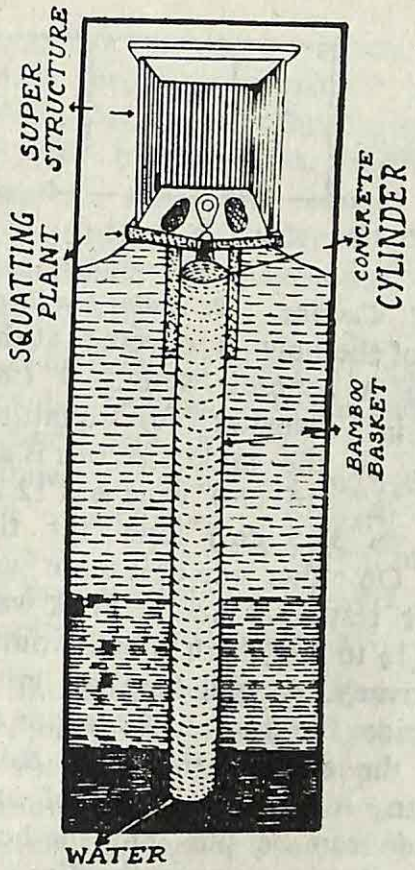


Fig. 3.4—Bore Hole Latrine

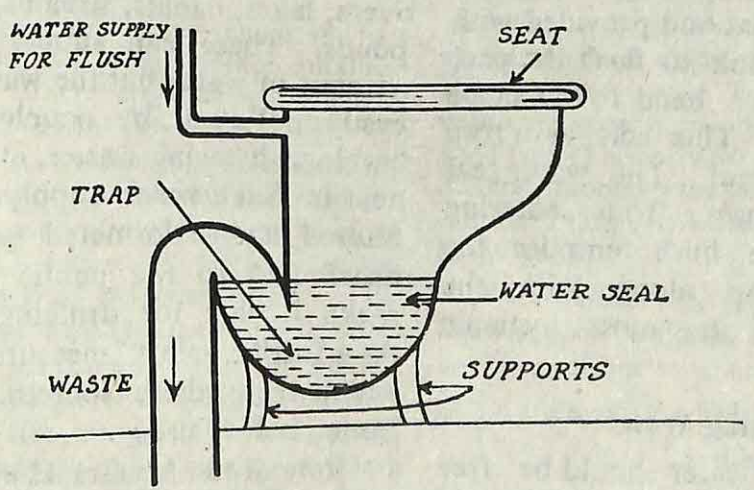


Fig. 3.5—A flush out type lavatory

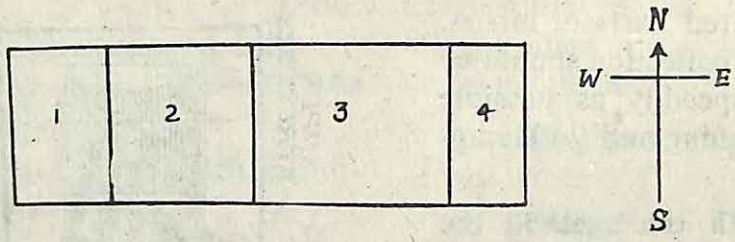


Fig. 3.6—A House Plan

Area. 1. Cooking 2. Eating and living 3. Sleeping 4. Washing and sanitation

opening of the hole is covered at the top with a concrete slab 2′ 9″ (·84 metres) in diameter for squatting purposes. In the middle of this is an opening 5½″ (14 cm) wide and 12 to 15″ (30 to 37·5 cm) long for the excreta. On either side of it there are two foot rests. A mud or brick wall 5′ or 6′ (1½ to 2 m) high is built round it for privacy. A split bamboo lining is put inside the Bore Hole latrine to prevent the earth at the sides from falling in. A small quantity of any insecticide can be put into the hole once a week to keep away the flies.

In urban areas where there is piped water supply a *flush-out lavatory* is the best type. It is made up of a porcelain pan with a seat and provided with water from a tank to flush the pan. Below the pan is a bend in the shape of a letter 'S'. This acts as a trap with the water seal. The water seal prevents the gases from entering the house. The flush empties the water in the trap along with the excreta. This is the most hygienic type of latrine.

Sources of Drinking Water

The drinking water should be free from all impurities and disease-producing bacteria. It should be safe to drink. Impure water can cause water-borne diseases like cholera, typhoid, jaundice and dysentery because it contains bacteria of various kinds.

In villages the commonest source of water supply are wells. Shallow wells get contaminated easily, so they should be replaced by deep wells. A deep well should be made with bricks and cement having a cement slope at the base. It should be properly covered and have its own bucket fixed to draw out water. Bathing, washing of clothes and vessels and throwing of wastes near it, should not be allowed. The well should be cleaned regularly.

In urban areas the source of drinking water is mostly surface water like rivers, lakes, canals, streams, tanks and ponds. These can supply a large amount of water but the water can be easily polluted by people washing, bathing, throwing wastes, etc., into or near it. Such water supply should be filtered and chlorinated before it is distributed to the public in order to make it safe for drinking purposes. As a further safety measure, drinking water from these sources should be boiled before use.

Role of the Municipal or Corporation authorities :

It is the duty of the municipalities

to provide safe drinking water and proper arrangements for the disposal of refuse for all urban areas. If this is not done the health of the population will be in great danger due to the incidence of diseases like typhoid, cholera, dysentery, jaundice, etc.

Healthful Housing. "Every house where love remains and friendship is a guest, is surely home and home sweet home, where the heart can rest". So the home is the centre of one's life. It is the place where a child spends the greatest part of his time. It is in the home that the basic rules of health are learnt. On these the later life of a child depends. Since the house is so important it should fulfil certain basic requirements. A good house should have cross ventilation with doors and windows facing each other. It should also have adequate natural lighting in every room, and a separate living room, bedroom, kitchen, bathroom and toilet. The bethroom and toilet should be away from the kitchen. If possible, the house should have a courtyard or a garden attached to it for children to play outside in the fresh air.

There should be proper planning of essential facilities in towns and villages and adequate provision made for the following : Open areas for recreation, safe water supply, sanitary disposal of wastes, proper lighting of streets and proper placing of markets, schools, hospitals, cinema houses, etc.

It can be rightly said that environmental conditions bear a close relation to the health of the people. Proper attention to the environment, will prevent disease and ensure a better and healthier life for all concerned.

Summary

The environment plays an important part in the life of the people both in rural and urban areas. There are different problems which are faced by the two communities.

In *rural areas* bad housing conditions, improper disposal of wastes, impure water supply, absence of proper drainage are some of the problems. A good method of refuse disposal may be by means of the compost pit and the other by means of the Gobar Gas plant, which produces fuel gas that can be used for cooking, lighting and as a source of power. The Bore Hole Latrine for villages is a good type of latrine for disposal of human excrete. Deep wells in rural areas provide the safest source of drinking water.

In *urban areas* congestion due to buildings and population exists. There are few open spaces, too much traffic, air, water noise pollution are the major health hazards. The flush-out system in cities and towns is a good type of lavatory for disposal of human excreta. Moreover the water from the source is filtered, then chlorinated before distribution to the public.

The requisites of a good house are proper lighting, good ventilation with good sanitory arrangements for water and refuse disposal.

I. Essay Type and Short Answer Questions

1. Briefly discuss the important health hazards in our big towns.

2. In what different ways can we educate the villagers to keep their homes and surroundings clean ?

3. Why is the proper disposal of refuse and wastes so important ?

4. What are the advantages of using the gobar gas plant in the villages ?

5. What is a compost pit ?

6. Compare and contrast the Bore-Hole latrine with the Flush-out one.

7. In what different ways can water be polluted ? How can we make water safe for drinking ?

8. What are the basic requirements of a good house ?

II. Objective Type Questions

(*a*) Fill in the blanks in the following statements choosing the words given in the list below :

Hazards, insanitary, dysentery, elephantiasis, refuse, compost, humus, combustible power, sanitary.

1. Dung heaps pose serious health .....in our villages.
2. Flies breed under.....conditions.
3. Flies spread various diseases like cholera, typhoid and.....
4. Mosquitoes spread various diseases like malaria, dengue fever and.....
5. Villages need to have pure water supply, better housing and proper disposal of wastes or.....
6. The best method of disposal of household wastes is by means of a.....pit.
7. Bacterial action changes wastes into .....which can be used for the cultivation of crops.
8. Dung is fermented to yield a highly valuable,.....gas known as the Gobar Gas.
9. Gobar gas can be used for cooking .....and lighting purposes.
10. In rural areas the Bore-Hole Latrine is the best type of a.....latrine.

(*b*) *True-False* : Put (√) against the true and (×) against the false statements.

1. A flush-out lavatory is the best type of latrine for urban areas.
2. Jaundice is a water-born disease.
3. The water in shallow wells is the purest form of water.
4. Bathing, washing and throwing of wastes should be done near a well.
5. In urban areas water is filtered and chlorinated before distribution.
6. A good house should have cross ventilation and adequate lighting.
7. The environment and health of the people go hand in hand.
8. Every area should have some open space for children to play in large cities.

Activities

1. Make a poster showing the most important methods of keeping drinking water from bacteria.

2. Study the water supply in your school. How many of the following questions can you answer by "yes" ?

(*a*) It is easy to get a dring of water whenever thirsty ?
(*b*) Are drinking water coolers provided ?
(*c*) Are there any chances of bacteria getting into the water supply ?
(*d*) Are wash basins, soap and towels provided in the toilets ?
(*e*) Do you think any changes should be made to have a better supply of water for washing and drinking ?

3. Make a neat plan of your own house.

□

CHAPTER 4

Personal Health Practices for Preservation and Promotion of Health

Personal hygiene is the science of preserving and promoting health, mainly through the active efforts of an individual. It is practised through sanitary habits and a healthy way of life.

Ill health is due to the unfavourable reaction between an individual, the disease producing agent and the environment. If an individual is constitutionally strong and observes good personal hygiene, he can successfully fight the offending microbes and the unfavourable environment. This state of personal health can be acquired only through one's own active efforts in the following directions.

Knowledge of Health and Disease

An individual needs to have full knowledge of health and disease in order to prevent illness and acquire positive health.

Motivation

A lot depends on how much importance one gives to health and on one's attitude towards health. Every one should realize that excellent health is the key to success in life and is worth striving for.

Personal Comfort and Well-being

Personal well-being depends on the physical environmental factors like proper ventilation, temperature, lighting, etc. It also depends on the personal factors like cleanliness, clothing, etc., and the social factors like enough money, good occupational and working conditions, family life and good social friends.

Personal Cleanliness

It is very important for us to keep our body clean because bacteria thrive in dirt and cause disease. Clean habits are basic to good health. Habits of cleanliness should be developed from early childhood. The following are important :

1. To have a bath every day.
2. To keep feet clean.
3. To wash hands thoroughly with soap and water every time after going to the toilet and before taking food.
4. To brush the teeth in the morning and before going to bed at night.
5. To rinse the mouth well after each meal in order to wash away food

particles embedded in the spaces between the teeth. This prevents tooth decay.

6. To keep the hair clean and free from lice. Long hair should be washed at least once a week.

7. To cut the nails short in order to prevent dirt collecting under them.

8. To keep the eyes clean and take special care of them by reading in proper light, avoiding glare, etc.

9. To ensure regular, bowel movement every day by taking a proper diet and enough water during the day.

10. To wear clean clothing because, dirty clothes harbour sweat, bacteria and ticks, mites and lice.

Clothing

Clothes should be changed and washed daily. Clothes should be selected according to the season. White or light-coloured, thin and loose clothes should be worn in summer. Dark, heavy and well-fitting clothes should be worn in winter. The shoes should be comfortable and of the proper size.

Walking bare footed is dangerous because tetanus, warts, hookworms, bites and mechanical injuries may be caused.

Cleanliness as a Social Responsibility

It is our duty not only keep our body clean but also to keep our surroundings and public places like roads, parks and offices, clean. We should not throw rubbish around but put it in the bins provided. Also we should not spit on the road but into the spittoons.

While coughing and sneezing we should use a handkerchief to prevent spreading the infection to people around us.

Avoidance of Bad Habits

Just as good habits have to be consciously cultivated in order to keep ourselves in good health, bad habits have to be avoided or given up. These harmful habits are smoking and chewing of tobacco and excessive drinking of alcohol. Smoking is definitely harmful. It causes irritation of the respiratory passages and diseases like lung cancer, high blood pressure, coronary heart disease. Smokers not only have poor health but also have a shorter life span on account of greater susceptibility to the above-mentioned diseases. Tobacco chewing has been shown to be the commonest cause of cancer of the mouth. Excessive drinking of alcohol is a social, moral and economic disaster for the whole family. It also has a very profound effect on the health of the individual. It may lead to mental depression ; heart disease, liver damage and chronic gastric complaints.

Since all these habits are so harmful it is best to resist getting into them; and those who have formed them should try to get rid of them as soon as possible.

Proper Nutrition

Good nutrition is the foundation of good health. So diet should be adequate and well-balanced with plenty of variety in it. Meals should be taken

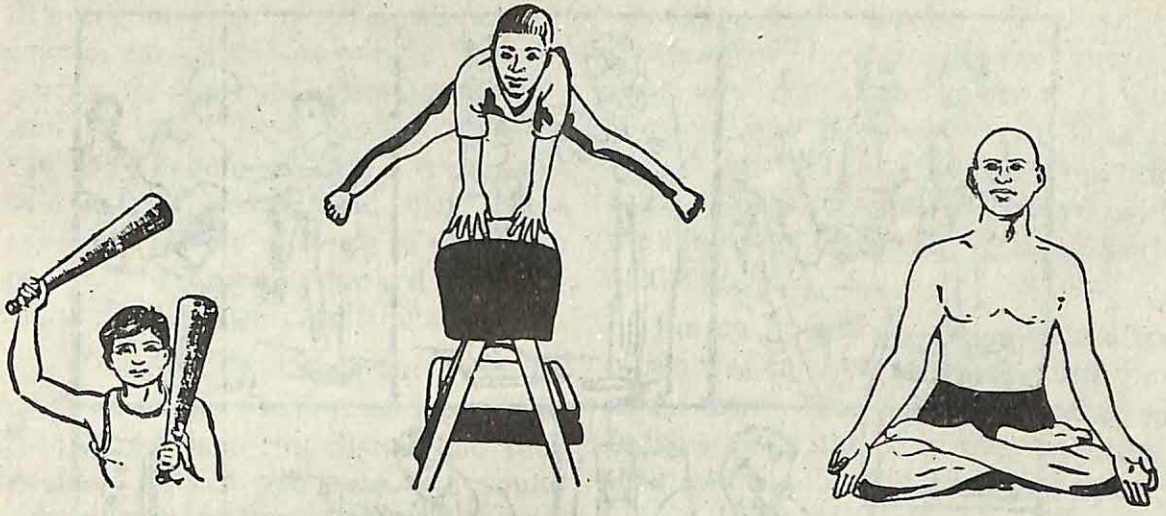


Fig 4.1—Make Exercise a Regular Habit

at regular times and should be light and nourishing. Food should be kept covered and protected against contamination by dust and flies.

Exercise and Activity

Exercise and physical activity help to keep the body fit. Regular and modcrate exercise tones up the body, keep the body-weight constant and maintains the proper working of the body. Swimming and out-door games are good forms of exercise.

Rest and Recreation

Proper rest and relaxation are needed to avoid fatigue and regain efficiency. Every one should have sufficient sleep—6 to 8 hours for adults and more for children. Rest after physical and mental activity is refreshing. We should avoid fatigue of all kinds.

It is very important to cultivate hobbies and other interests in addition to having a satisfying vocation. These lend colour and variety to life and make it more cheerful and bright.

Prevention of Infection and Immunisation

Prevention is always better than a cure. It is wise to protect ourselves and our families against the common preventible diseases like smallpox, cholera, typhoid, tetanus, diphtheria, whooping cough, polio, tuberculosis, etc. This can be done by taking the necessary vaccinations and inoculations.

If we have a person suffering from an infectious disease at home we should isolate him from the others. Children should be specially protected against infections.

Regular Medical Check-up

This is very helpful right from the beginning as physical or any other kind of defect if detected early enough, can be corrected to a great extent. Early diagnosis of serious diseases like tuberculosis and cancer leads to a complete cure.

A regular medical check up of children in school serves a very useful

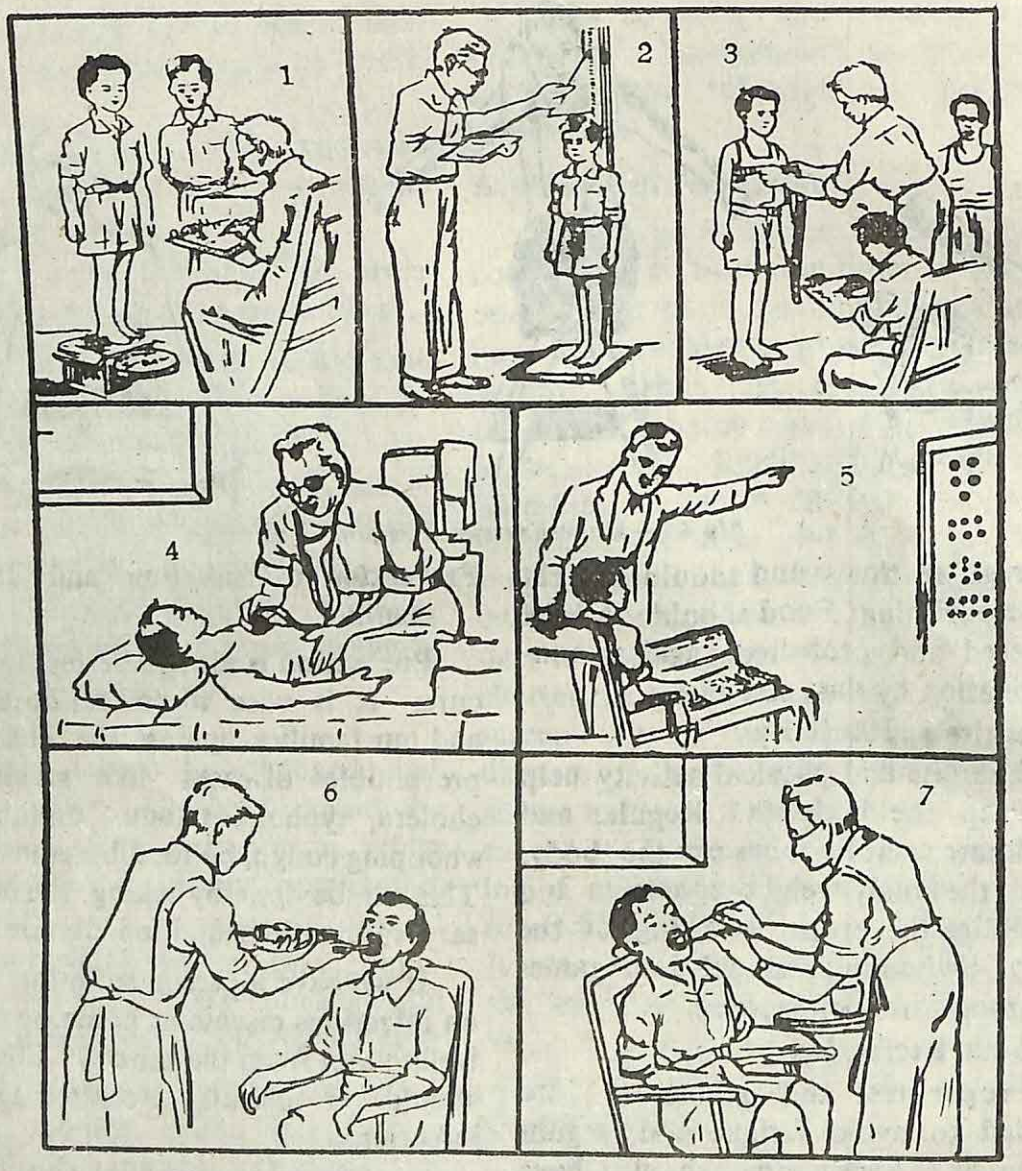


Fig. 4.2—Regular medical check-up—a great boon to health

1. Taking weight
2. Measuring height
3. Taking chest measurements.
4. Checking the chest, heart and lungs.
5. Testing eye sight.
6. Examining the throat.
7. Dental check up.

purpose in detecting developmental problems.

Our Cultural Practices in Relation to Personal Health

Health is maintained by certain regularities in behaviour regarding diet exercise, rest and medication, when required. These patterns of behaviour are culturally conditioned and so differ from one community to the other

In every social group, there are accepted ways of eating, talking, meeting people, caring for the old, offering worship and so on. These socially accepted norms of behaviour form the customs of a society. As a general rule, people conform to the customs of their own particular group and marked deviations from these customs are frowned upon.

We will now briefly survey some of these customs with regard to food, fasting, hygiene and disease and then decide, which of these are sound scientifically and should be continued, and which are unsound and need to be discarded.

Food Habits

In our country food habits are guided by such social factors are caste and religion. Hindus do not eat beef but they may eat mutton, fish and fowl. Muslims do not eat pork for religious reasons. Foods are supposed to possess some sacred qualities which are believed to affect the moral character of a person. So the Brahmins are supposed to take only vegetarian food and even avoid onion and garlic.

The keeping of fasts for religious reasons is said to be a self-purifying process. However too, much fasting leads to headache and anaemia.

We should realize that these differing views about the innate qualities of foods and their role in causing diseases and their cure have no scientific basis.

Ideas Regarding Hygiene

Conceptions of what constitutes cleanliness, uncleanliness and dirt vary throughout the world. The silken clothes worn by Brahmins even though, dirty are considered to be a sign of purity. Some people believe that wearing shoes in the house is a unclean habit, while others always move with the shoes and chappals on, in all parts of the house.

Formerly rinsing the mouth after meals was an established pattern but now many so called westernized Indians do without it thus exposing themselves to the danger of tooth decay.

In many parts of India villagers do not have ventilators in their houses for fear of evil spirits creeping into the house and causing diseases.

Ideas Regarding Disease

Social customs differ widely with regard to the ideas about disease.

Some diseases like small-pox, chicken-pox, measels, etc., are considered to be due to divine wrath. Diseases like leprosy, sterility, etc , are considered to be diseases of divine punishment. Hysteria, epilepsy, etc., are considered to be diseases of super-natural wrath while a large number of children's diseases are thought to be diseases of 'Evil Eye'. Among the Hindus, serious illnesses are supposed to be due to some misdeeds in the previous birth and are treated by way of offerings to God or by distributing gifts to the poor.

It is clear from the above examples that the germ theory of disease is but little understood and proper scientific knowledge of diseases has to be imparted before we can expect people to give up their old beliefs and accept the

modern techniques in the diagnosis and treatment of disease.

In short we can say that we should critically examine our customs and ideas regarding food, fasting, hygiene and disease in the light of modern scientific knowledge. Those customs which are good and have a scientific basis should be promoted while the bad ones should be replaced by better ones.

Summary

Personal hygiene is the science of preserving and promoting health mainly through the active efforts of an individual. It is practised through sanitary habits and a healthy way of life.

In order to acquire a good state of personal health an individual needs to do the following :

1. Acquire a good knowledge of health and disease.
2. Develop positive attitudes towards health.
3. Look after his personal cleanliness of all parts of the body.
4. Wear proper clothing.
5. Keep his surroundings clean.
6. Take proper nutrition.
7. Take regular and moderate exercise.
8. Plan a programme of proper rest and recreation for himself and his family.
9. Avoid bad habits of smoking, chewing tobacco and drinking alcohol.
10. Take preventive inoculations against infectious diseases.
11. Go for a regular medical check up.

Patterns of behaviour (customs) regarding food, fasting, hygiene, disease and medication are culturally conditioned and so differ from one community to the other. These customs should be critically examined in the light of modern scientific knowledge and the good customs retained while the bad ones discarded and replaced by better ones.

I. Essay Type and Short-Answer Questions

1. How would you make every one come to class with clean skin, teeth, hair, nails and clothes so that your classroom becomes more attractive and pleasant ?
2. What is the importance of cleanliness for an individual ?
3. In what ways are smoking and drinking alcohol harmful ?

II. Objective Type Questions

(*a*) Fill in the blanks :

1. Personal Hygiene is the science of.....and.....health solely through the efforts of an individual.
2. A knowledge of health prevents..... and one acquires.....health.
3. Excellent health is the key to..... in life and is.....striving for.
4. Personal well-being depends on proper ventilation, ...lighting and above all.....of the person.
5. Habits of.....should be developed from early.....
6. White or.....clothes should be worn in summer and dark or..... clothes should be worn in winter.
7. The harmful bad habits are..... and.....
8. Food should be kept covered and protected against contamination by.....and.....

(*b*) *True False*: Mark ✓ against true statements and × against false statements in the following :

1. Measles, small-pox and chicken-pox are considered to be diseases of divine wrath.
2. A large number of children's diseases are caused by the "Evil Eye".
3. Modern techniques in the diagnosis and treatment of diseases are based on scientific knowledge.
4. Isolation helps to control the spread of infectious diseases.
5. A regular medical check-up in schools is useful to detect developmental problems.
6. We should learn to change our food for better health.
7. Fatigue is caused due to lack of proper rest and relaxation.
8. There should be no period of rest after physical and mental activity.

Activities

1. List out the good health habits you have already formed. Add to this list other habits that you wish to form this year.

2. The artistic ones in the class should make posters on "good habits" for the class Bulletin Board on topics like :

(*a*) Having a good posture while sitting and standing.
(*b*) Using eyes in the correct way.
(*c*) Saving money and putting it in the bank.
(*d*) Spending money on fruits instead of chocolates.
(*e*) Playing games.

□

"The field of possibility is beset around with a hedge of thorns."

Health Hazards of Modern Age

CHAPTER 5

Health Hazards of Modern Age

We are livinig in an age of grave ecological crisis—a crisis which has been created by the imbalance between the population, resources and environment.

In the middle of 1971 there were 3,700 million people on earth. If the population continues to grow at the present rate of 2% per annum the world population will double itself in 35 years (*i.e.*, before the turn of the century). Such large numbers and such a rapid rate of increase in population, has never been known before in the history of mankind.

This population explosion has put a great stress on the resources of the earth and its life-support systems. Since the supplies of food, minerals and fossil fuel (coal, oil, petroleum) resources are limited, the earth cannot possibly support these increasing numbers.

The growth rate of a population is the difference between the birth and death rates. As long as the birth rate exceeds the death-rate, the population will grow. If the death rate exceeds the birth rate it will decline. If they are equal, the population size will remain stable. This is called Zero Population Growth (Z.P.G.).

In the developed countries like the U.S.A., U.K., France, U.S.S.R., etc.,

the population growth rate is 1% while in the developing countries in most of Africa, South America and Asia, the average growth rate is 2 to 2·5%. This means that the population is growing faster in those countries which are poorer and less able to support it. In order to stabilize the world population, all countries should strive towards Zero Population Growth. This can be attained by all couples having not more than two children.

Impact of Population Explosion

1. *Food Shortage.* This serious increase in population has led to grave consequences. Almost half the people in the world today are either under-nourished (lacking calories) or more commonly, mal-nourished (usually lacking in protein). Between 10 and 20 million people die of starvation every year and most of them are infants and children. In addition, to this many millions are not able to grow and develop fully due to a poor diet and other kinds of hardship. Food production is failing to keep pace with the growth of population. Further, the distribution of food is unequal. Even if food is available, poor people all over the world are unable to buy it because it is so expensive. A serious point to consider is that if we are not able to feed ourselves adequately today, how can we hope to feed the additional hundreds of millions a few years hence.

2. *Shortage of Other Resources.* Besides food many other resources are running short, particularly the non-renewable ones like copper and petroleum. The bulk of these resources, is consumed by the developed countries. According to the present estimates, the supply of petroleum and other important minerals will be exhausted within 50 to 150 years.

These resources are no doubt required by industry but we cannot afford to consume them in the present wasteful manner much longer. We are all fully aware of the energy crisis which is being faced by most countries today. Alternative sources of energy have to be found soon, in order to maintain and increase industrial output.

Besides the frantic consumption of non-renewable resources (mineral and fuels), we are also fast using up renewable ones like forests, soils and fresh water. In all these three cases, we are consuming or destroying much more than we are replenishing, the results have been very harmful and have led to the advancing of deserts and over-grazing of pastures.

Man's Impact on the Environment

As you already know, a biological community is a balanced community. Its successful survival depends upon the interaction and inter-relationships between the physical environment (air, water and land) and the living beings (plants, animals and micro-organisms) themselves. Man is the only organism who can control the environment and thus influence the biosphere.

In order to feed his growing numbers he has cut down forests

(*deforestation*) which has led to *soil erosion* and advancing of deserts.

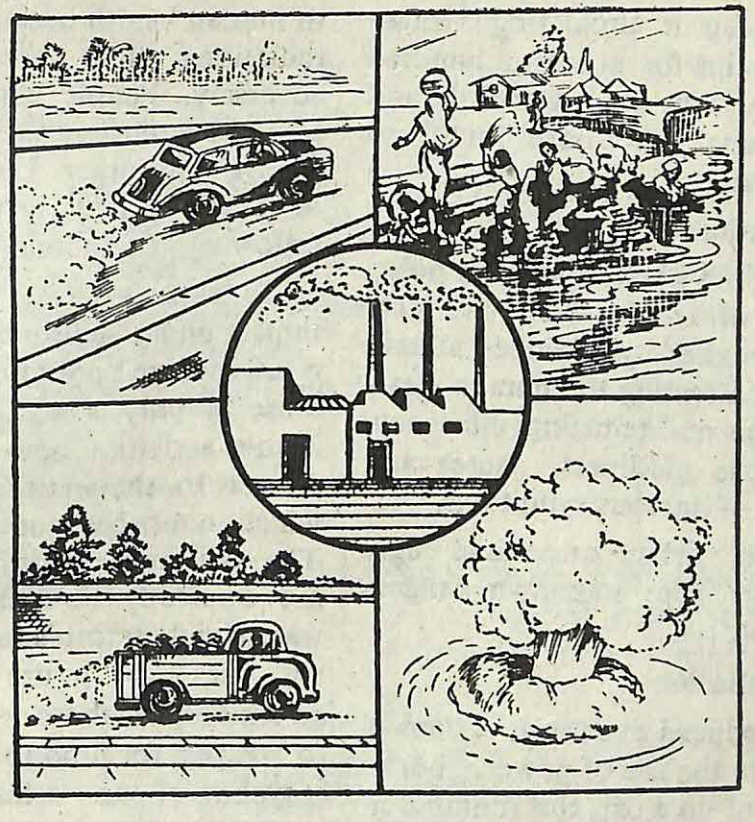
Further, in order to increase food production he has used powerful synthetic pesticides and inorganic fertilizers. Such modern farming practices have brought in the Green Revolution but have caused serious environmental problems (*Agricultural pollution*). The non-biodegradable chlorinated hydrocarbons like D.D.T., used as pesticides are found in every living plant and animal around the world, on land and in the sea. D.D.T., accumulates in the fat of the organisms. It does not break down readily into harmless substances, but rather it is concentrated by ecological systems. So the concentration of D.D.T. is greatest in such animals as predatory birds and fishes that feed at the upper ends of food chains. Numerous species of such birds and fishes are threatened with extinction due to the effect of these pesticides. As the quantity of these poisons increases in the environment, species lower in the food chains will also be affected. These species are often involved in the food chains that produce human food, particularly the marine phytoplankton, so the chances of getting more food from the sea are not so bright.

Agricultural activities also produce many other serious pollutants like inorganic fertilizers and atmospheric dust. This dust influences the weather. Inorganic fertilizers not only pollute the rivers and lakes killing off useful fishes, but also appear to interfere with the natural processes of the soil that renew and refresh it. The inorganic fertilizers increase the soil fertility temporarily but in the long run they are harmful and reduce soil fertility because, they interfere with the normal activities of bacteria in the soil.

Pollution of the Environment

The crisis of population versus food and resources alone, would be a massive challenge for humanity to face over the next twenty to thirty years. In addition, rapid industrialization and modern technology have led to a serious deterioration in the environment. As a factor in human health and well-being, environmental pollution is a serious cause for alarm, specially in the developed countries where most of it is produced.

Air pollution in the highly industrialized cities has led to an increase in respiratory diseases. It damages trees and crops as well as human tissue. The common pollutants in the air are smoke, dust, carbon-monoxide, sulphur dioxide, lead compounds and other harmful particles and gases given out from the chimneys of factories and exhaust fumes from automobiles (motor cars, buses, etc.), and also gases and smells given off from animal excreta. So the air in big cities is no longer 'pure' and safe to breathe in. Further, air pollution may induce changes in the climate. Smog (smoke plus fog) is no longer a local problem of large cities but it contaminates the entire atmosphere, less sunlight filters through smog and so the rate of food production (photosynthesis by green plants) goes down, also less bacteria



Discuss the hazards involves in each one of these pictures.
Fig. 5.1—Health Hazards of Modern Age

are destroyed and so the incidence of diseases increases. More people in these areas suffer from asthma, bronchitis and pneumonia.

Air pollution at the moment seems to be having a cooling effect on the climate. Scientists feel that these changes due to pollution, will have an adverse effect on agricultural production.

It has also been found that the use of supersonic aircraft adds to air pollution because they leave semi-permanent trails in the stratosphere, thus reducing the amount of sunlight that can reach the surface.

Water pollution also poses a serious threat. The common pollutants in the water are insecticides, industrial wastes, sewage, fertilizers and other kinds of wastes. Polluted waters can cause and spread a large number of water-borne diseases like cholera, typhoid, dysentery, hepatitis, etc. In highly industrialized countries like the U.S.A. Japan and in European countries methyl mercury has been found to circulate in food chains more or less like D.D.T. does and has also been shown to affect photosynthesis in marine phytoplankton. It has been estimated that enough mercury has already been deposited in North American

waters to keep it circulating through the food chains for at least a hundred years ! Even fish like swordfish and deep sea tuna have been found to contain mercury.

Noise Pollution

Modern life has become very noisy. The noise of traffic in big cities, the aeroplanes and noisy machines, all take their toll in affecting the human hearing apparatus and reducing efficiency. It may cause giddiness, nausea and other types of nervous symptoms.

Crowded urban areas and ugly surroundings pose unknown dangers to mental health.

Thermal Pollution

Heat produced as a result of human activities like the use of power, burning of petrol in a car, the running of machines or the generation of electricity by power plants, may alter subtle balances in the global heat system and cause rapid and perhaps very adverse changes in the climate. If we continue to use power at this rate a local problem of thermal (heat) pollution may assume very serious proportions. So power consumption should be drastically cut.

If we switch over to nuclear power we would be adding radiation dangers to thermal pollution, though, it would reduce other types of pollution associated with power plants.

Radiation Hazards

Nuclear power plants and working of other nuclear devices produces a radio-active fall out. This is dangerous to human health because the nuclear radiations affect the human systems adversely. People exposed to radio-active substances are likely to develop cancer and other kinds of abnormalities which may be passed on to the following generations.

In sum we can say that man's impact on his environment has reached a state where "pollution" in the usual sense is only a part of the problem. Man's activities now present a grave danger to the entire planet Earth, which nourishes and supports us all. The poisonous substances which we are carelessly throwing into the soil, waters and atmosphere, not only harm us, but also injure the ecological systems on which we depend for oxygen to breathe, for food to eat and for the recycling of our wastes.

We now find ourselves in a peculiar situation. There are too many of us and our population is still increasing very rapidly. We are finding it more and more difficult to feed ourselves and obtain the other resources we need, Further, we are not using these resources properly—there is a lot of wastage and mismanagement. In our frantic efforts to grow more food and get more raw materials for industry, we are seriously damaging the delicate life-support systems of the earth thus making it more difficult to provide for ourselves in future.

What is the Solution to Our Problems ?

1. First and foremost, we must stop the further growth of population

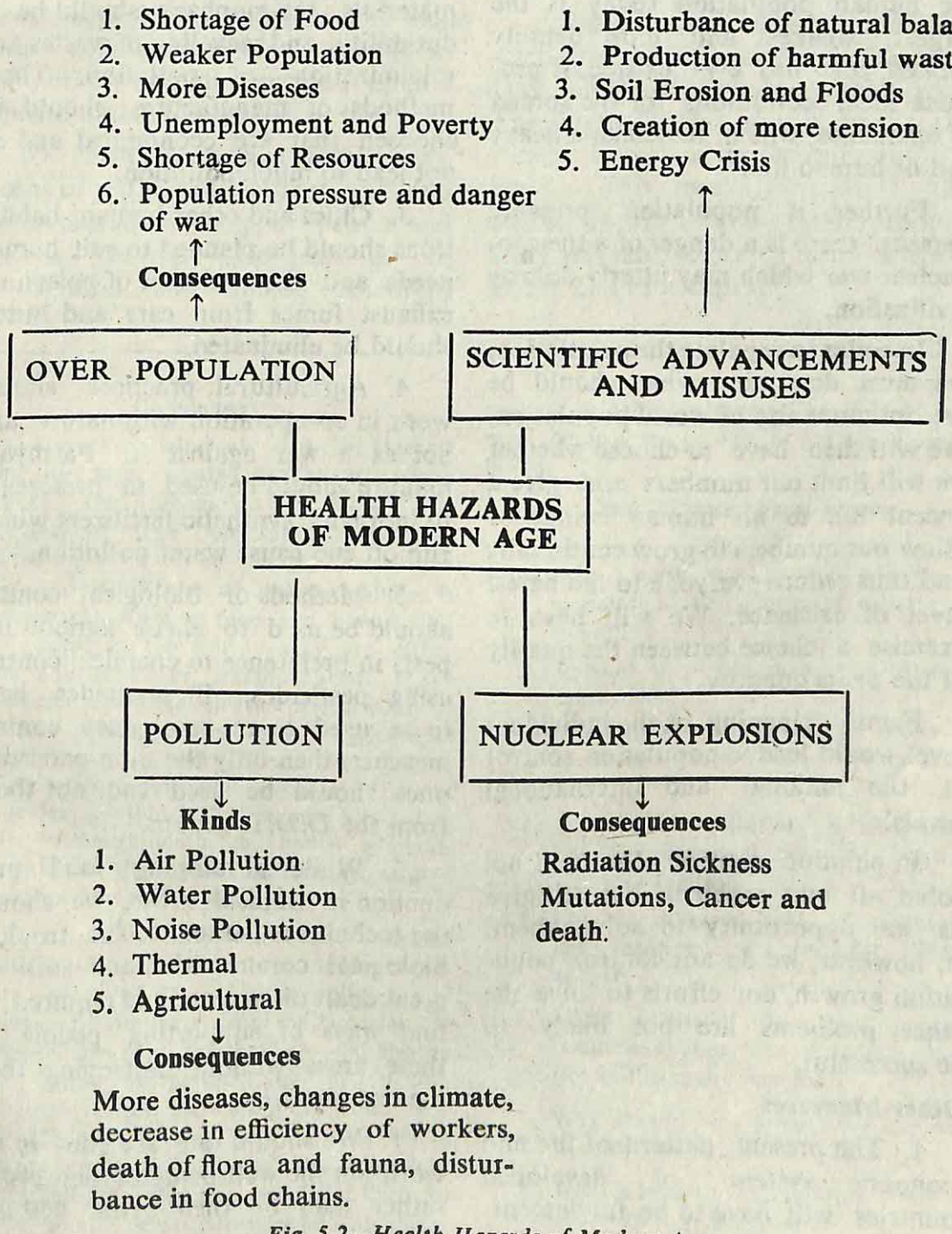


Fig. 5.2—Health Hazards of Modern Age

as soon as possible. If we do not do so, some natural calamity will come to reduce our numbers drastically. Since the human population today is the largest, weakest and most densely packed that has ever existed, it provides ideal conditions for the spread of epidemics which may take a heavy toll of human life.

Further, if population pressure persists there is a danger of a thermonuclear war which may utterly destroy civilization.

In order to regulate the population, we must determine what should be the optimum size of world population. We will then have to choose whether we will limit our numbers and give a decent life to all human beings or allow our numbers to grow continually and thus reduce everyone to the barest level of existence. We will have to exercise a choice between the quality of life or its quantity.

Family planning at the individual level would lead to population control at the national and international levels.

Population control alone will not solve all our problems but will give us an opportunity to solve them. If, however, we do not control population growth, our efforts to solve the other problems are not likely to be successful.

Other Measures

1. The present pattern of life and economic system of developed countries will have to be fundamentally changed. More economical methods of production will need to be adopted.

2. In the production of goods and materials, the emphasis should be on durability, and recycling of wastes and minimization of pollution. Those methods of manufacture should be choosen that are economical and do not lead to much pollution.

3. Cities and other human habitations should be planned to suit human needs and the emission of poisonous exhaust fumes from cars and buses, should be eliminated.

4. Agricultural practices should work in co-operation with nature and not as a war against it. Farmyard manure should be used in preference to inorganic synthetic fertilizers which run off and cause water pollution.

5. Methods of biological control should be used to check agricultural pests in preference to chemical control using pesticides. If pesticides have to be used as an emergency control measure, then only the non-persistent ones should be used and not those from the D.D.T. group.

6. While developing food production in tropical areas, we should use techniques suited to the tropical biological communities and soil. A great deal of research is required to find ways of supporting people in these areas without destroying their natural resources.

7. We should rate societies in the world on the well-being of their people rather than on their gross national products.

8. A solution to the 20th century multiple crisis requires a revolutionary change in attitudes and values all over the world. We must realize that all human beings stand together as a single entity with each person dependent upon others and all dependent upon a delicate planet for continued life.

We must reject war totally as a means of settling differences and end the exploitation of poor people and nations. We must also learn to use the natural and human resources wisely. Then only we can hope to solve the problems which face us today.

A step in this direction, is the celebration of "World Environment Day" on the 5th of June each year. The slogan for this day is "Save the Planet Earth—it is the only one you have". This speaks for itself and makes us all aware of the responsibility we have towards our environment. Let us accept it !

Summary

The grave ecological crisis that faces us today has been created by the imbalance between the population resources and environment. The population explosion has put a great stress on the resources of the earth and its lift-support systems. There is a serious shortage of food and almost half the people in the world today are either under-nourished or malnourished. Many other resources like minerals and fossil fuels are also running short. Man's agricultural efforts to grow more food, have led to deforestation and soil erosion. Use of pesticides of the D.D.T. group has led to their concentration in the bodies of plants and animals. Inorganic fertilizers are washed into the waters and pollute them.

Environmental pollution is a serious health hazard and should be minimized in every possible way. Air is polluted by smoke and waste gases from the factories and exhaust fumes from automobiles, and also by dust. Water is polluted by insecticides, industrial wastes and sewage. Noise and thermal pollution also pose serious health hazards. Radiation hazards also need to be eliminated. We must save the planet Earth by changing our values, attitudes and agricultural and industrial practices. Most of all, we must control the growth of the world population.

I. Essay Type and Short-Answer Questions

1. Why must the growth of world population be controlled as fast as possible ?
2. In what ways has man tried to grow more food ?
3. What have been the adverse effects of the Green Revolution on the environment ?
4. Briefly define pollution. In what ways has environmental pollution become a serious health hazard ?
5. List the different kinds of pollution and mention two harmful effects of each.
6. Make a list of five steps that all countries should take to reduce pollution of the environment.
7. Why should we discontinue the use of pesticides of the D.D.T. group ?
8. What is meant by population control ? How can it be achieved ?

II. Objective Type Questions

(*a*) Fill in the blanks with suitable words :

1. Almost half the people in the world are either.....or.....
2. Environmental pollution is a serious health.....
3. Air is polluted by.....and..... .....from factories.
4. Water is polluted by..... wastes and.....
5. Noise and.....pollution also pose serious.....hazards.
6. Most of all we must control the growth of world.....
7. Pesticides like.....get concentrated in the bodies of plants and animals.
8. Many other resources like.....and .....fuels are also running short.
9. We must save the.....earth, it is the only one we have.
10. World Environment Day is celebrated on the.....of June.

Activities

1. Make a suitable poster to highlight the importance of World Environment Day.

2. Make a list of steps you can take to keeping your environment clean start by keeping your classroom and school building clean.

"We are building every day ;
In a good or evil way ;
And the structure as it goes ;
Will our inward selves disclose ;
Build it well, whatever you do ;
Build it straight and strong and true,
Build it clear and high and broad,
Build it for the eye of God."

—Anon

Growth and Development

CHAPTER 6

Review of Body Structure and Functions

The human body consists of three parts, the head the trunk and the limbs. The neck joins the head with trunk. The head is made up of the face and the skull containing the brain. The large cavity of the trunk is divided into two portions by a horizontal muscular partition called the diaphragm.

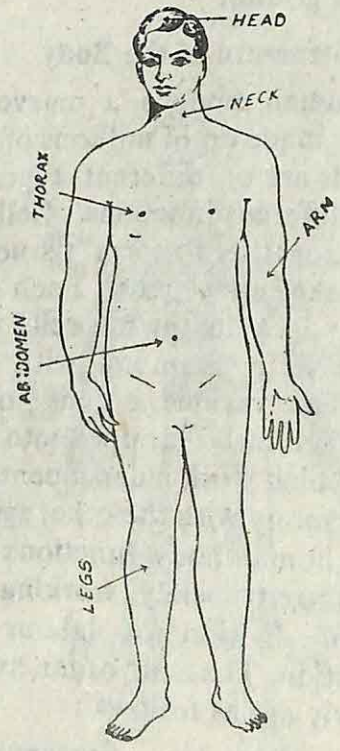


Fig. 6.1—External view of the Human Body

The upper, smaller cavity is called the chest or the thorax. It contains the heart, a pair of lungs, the wind-pipe and the food pipe. The lower, larger cavity is called the abdomen. It contains the liver, stomach, spleen, pancreas, small and large intestines. Behind these organs, lies a pair of kidneys. The lower part of the abdomen is called the pelvic cavity. It contains the urinary bladder, the rectum and the genital organs. Posteriorly, the skull cavity which lodges the brain, is continued downwards as the spinal cavity lodged in the vertebral column. This contains the spinal cord.

Two pairs of limbs are attached to the trunk with the help of the pectoral and pelvic girdles.

Internal Structure of the Body

The human body is a marvellous organism made up of millions of cells. These cells are of different types and perform different functions. Cells are grouped together to form tissues and tissues make up organs. Each organ not only does its own special work, but does it in harmony with other organs. The various organs of the body are similarly grouped into many systems which work independently but yet in hormony with the other systems. Thus the human body functions like a well-organized society working on a system of division of labour and specialization. The main organ systems of the body are as follows :

1. **The Skeleton System.** The Skeleton System is made up of 213

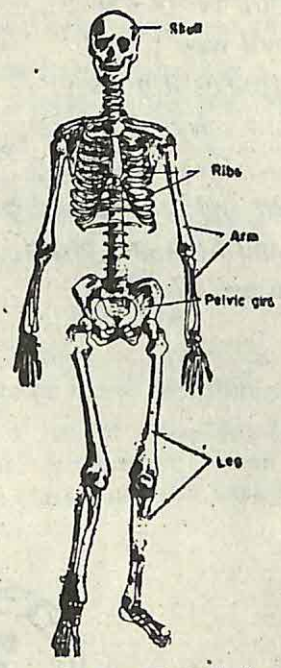


Fig. 6.2. The Skeleton System

bones and some cartilages. Bones are of different kinds and are joined together by ligaments to form joints. Joints allow the various movements of the body.

Bones give form and support to the body, protect the inner delicate organs and act as levers for the action of muscles.

2. **The Muscular System.** Muscles form the flesh of the body and have the property of contraction and relaxation. The muscular activity results in all kinds of body movements. Muscles also cover the bones and give form to the body. Muscles of the limbs, face etc., work under the control of our will and are called Voluntary Muscles, while muscles of the heart and other internal organs

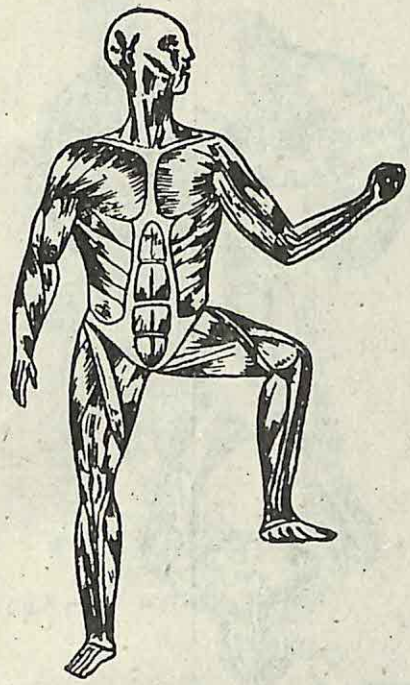


Fig. 6.3—The Muscular System

are not under the control of our will and are called Involuntary Muscles.

3. **The Digestive System** consists of a long tube (the alimentary canal) and its associated glands. The alimentary canal begins with the mouth and is continued as the food pipe, stomach, duodenum, small and large intestines, opening out at the other end through the anus. The associated glands are the salivary glands, liver and pancreas.

The glands produce digestive juices containing enzymes that help to convert the complex food into a simple form. The digested food is absorbed by the blood and conveyed to all parts of the body. The undigested food is thrown out of the body as faeces.

4. **The Circulatory System.** The

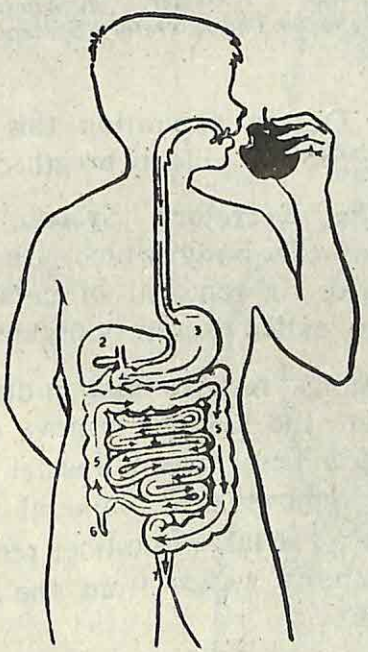


Fig. 6.4—The Digestive System

1. *Oesophagus.*
2. *Liver.*
3. *Stomach.*
4. *Small Intestine.*
5. *Large Intestine.*
6. *Appendix.*
7. *Rectum.*

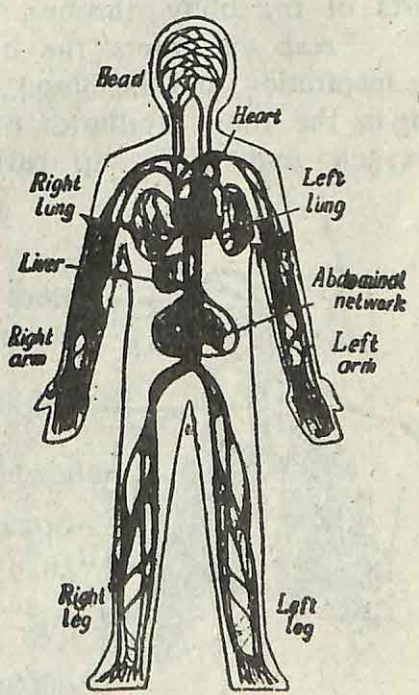


Fig 6.5—The Circulatory System

circulatory system is made up of the heart and a closed set of tubes called arteries, capillaries and veins.

The heart pumps blood to all parts of the body through the arteries and capillaries which permeate the tissues. Blood carries oxygen and food to the tissues and collects back carbon dioxide and other metabolic wastes formed in the tissues.

The veins bring back the deoxygenated blood to the heart from where it is sent to the lungs for oxygenation The metabolic wastes are removed by the kidneys and other excretory organs.

5. The Respiratory System. It consists of the nose, pharynx, larynx, the trachea, bronchi and the lungs.

Its function is to supply oxygen to all parts of the body through the blood. Fresh air enters the body during inspiration, and the blood, circulating in the lung capillaries, picks up oxygen and gives up carbon dioxide. During expiration this air, rich in carbon dioxide, is breathed out.

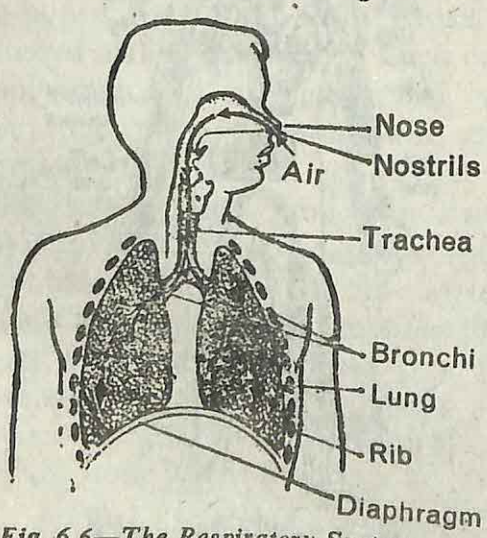
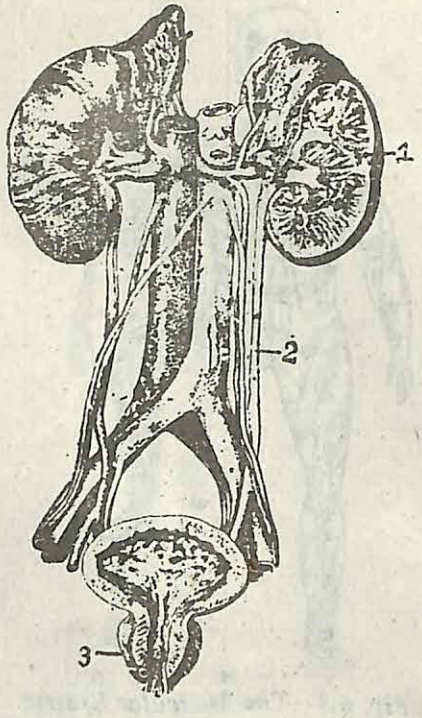


Fig. 6.6—The Respiratory System



1. Kidney. 2. Ureter. 3. Bladder
Fig. 6.7—The Excretory System.

6. The Excretory System. All organs of the body which are concerned with the removal of metabolic wastes are called excretory organs.

The lungs remove carbon dioxide and water ; the kidneys remove urea, uric acid, mineral salts and water ; the skin also removes urea, mineral salts and water. The large intestines remove the metabolic wastes from the liver (bile salts).

7. The Nervous System. It is made up of the brain and spinal cord along with the associated nerves and sense organs.

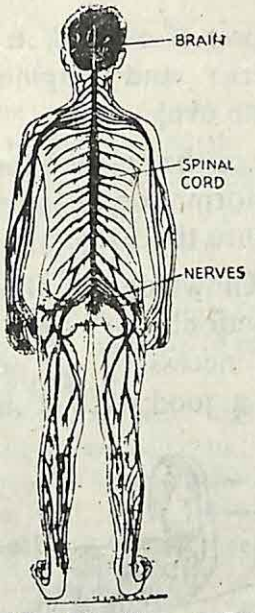


Fig. 6.8—The Nervous System

It makes us aware of our environment and also controls and co-ordinates the working of all other systems. The brain also provides the higher mental faculties like thinking, reasoning, judgment, emotions etc.

8. The Endocrine System. It is made up of a number of ductless glands situated in different parts of the body These are the pituitary thyroid, parathyroid, thymus, adrenals, islets of langerhans in the pancreas and the gonads. The secretions of these glands are called hormones and are distributed by the blood to all parts of the body. Hormones co-ordinate and regulate

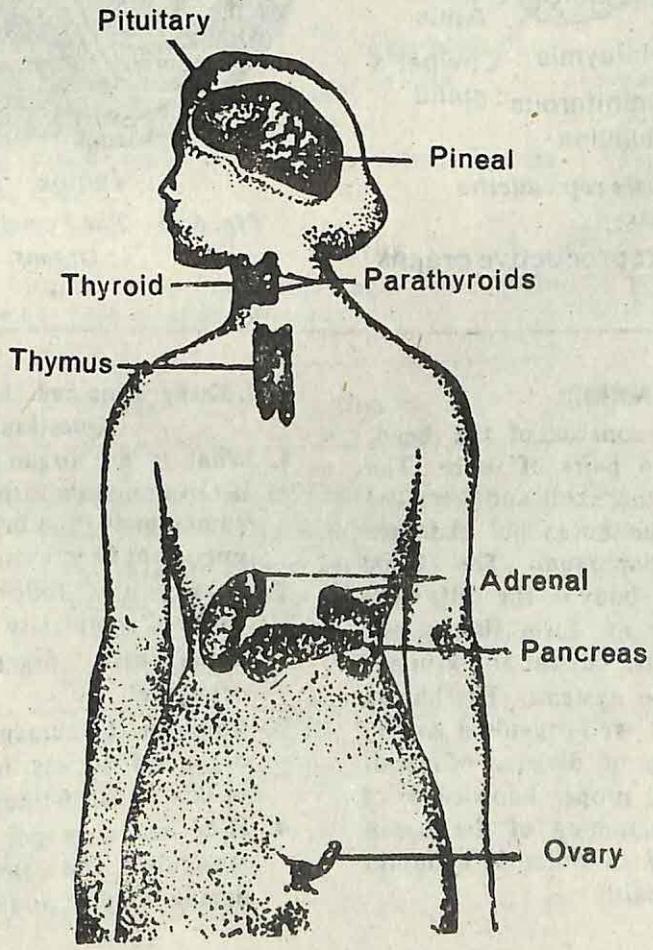


Fig. 6.9. Endocrine System

the growth and metabolism of the body.

9. The Reproductive System. The reproductive system is necessary for the propagation of the human race. The male reproductive organs consist of a pair of testes, their ducts and urethra. The testes produce sperm

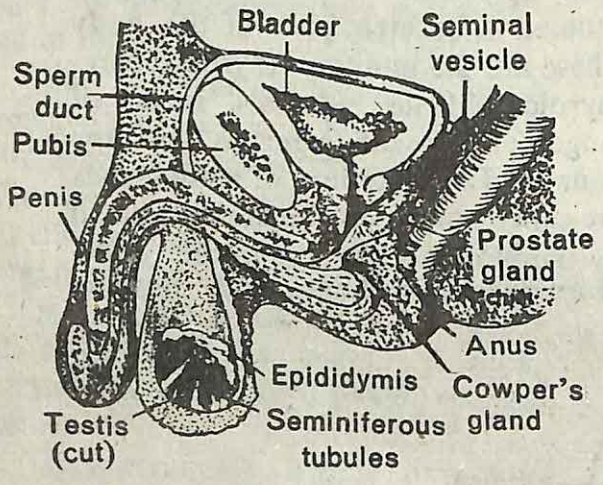


Fig. 6.10—The male reproductive organs.

cells. The female reproductive organs consist of a pair of ovaries, a pair of oviducts, uterus and vagina. The ovaries produce ova.

The union of the egg and the sperm results in the formation of the embryo which grows into the baby.

A proper knowledge of the structure and functioning of the human body is very necessary in order to maintain it in a good state of health.

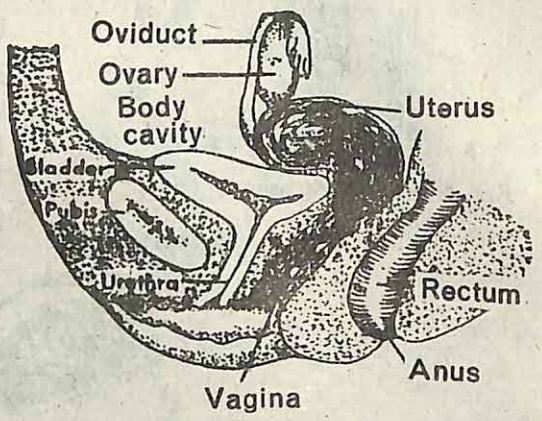


Fig. 6.11—The Female Reproductive Organs.

Summary

The human body consists of the head, neck, trunk, and two pairs of limbs. The head is made up of the skull and face. The trunk is divided into the thorax and abdomen by the muscular diaphragm. The basic structural unit of the body is the cell. Cells are grouped together to form tissues and tissues make up organs. Organs are grouped together to form organ systems. The human body functions like a well-organised society working on a system of division of labour and specialization. A proper knowledge of the structure and functioning of the human body is very necessary in order to maintain it in a state of good health.

I. Essay Type and Short-Answer Questions

1. What is an organ system? Make a list of the main organ systems of the human body and briefly mention their important functions.
2. Arrange the following in increasing order of complexity :—
   tissue, cell, organ system, organ, organism.
3. Compare the human body with a well-organized society in terms of division of labour for the important functions.
4. How can a proper knowledge of the structure and functioning of the human body be useful to you ?

II. Objective Type Questions

(*a*) Fill in the blanks ;

1. The human body consists of three parts, head,.....and the.....

2. A.....partition called the..... divides the trunk into two parts.

3. The thorax protects the.....and .....and the .....organs.

4. Two pairs of limbs are attached to the trunk with the help of the.....and .....girdles.

5. Cells are grouped together to form a .....and these make up.....

6. The various systems work on a system of division of.....and.....

7. Bones are joined together by..... to form.....

8. Blood carries.....to the tissues and collects.....wastes from them.

9. The two movements of breathing or respiration are.....and.....

(*b*) Column A contains a list of organ systems and column B a list of their functions. Match the organ system with its *correct* function by drawing lines.

Column A	*Column B*
Skeleton System	Undertakes the transport of blood.
Muscular System	Removes the body wastes.
Digesitve System	Required for the process of breathing.
Respiratory System	Concerned with food and digestion.
Circulatory System	Helps in various body movements.
Excretory System	Supports and protects the body.
Nervous System	Makes one aware of external forces.
Endocrine System	Helps in the propagation of the human race.
Reproductive System	Brings about co-ordination of the various parts of the body.
Sensory System	Produces the internal secretions.

Activity

Make a tabular form of the various systems and their functions as per the headings given below. An example has been done as follows :

S.N.	*Cells*	*Tissues*	*Organs*	*System*	*Functions*
1.	Bone	Compact and Cancellous Cartilage Ligament	Brain, Heart & Lungs Digestive organs+ Reproductive organs	Skeletal	1. Protection ; 2. Movement : 3. Support ; 4. Shape ; 5. Formation of blood cells.

CHAPTER 7

Growth and Development

Just as it is necessary to understand the structure and functioning of the human body in order to maintain it in a state of good health, it is necessary to study its growth and explain the behaviour of an individual.

There are two factors which determine what an individual is, what he does and what he becomes. Behaviour is the product of organic and environmental factors which work hand in hand. While studying the growth of an embryo it has been shown that the environment affects the growth of an organism even before birth.

A child's environment begins to ininfluence him as soon as he is born. How he is handled and cared for, what sort of sights and sounds and other sensory stimuli affect him, how his physiological needs are satisfied, all these influence the way in which the child grows. The influence of the environment increases as the child's abilities mature.

The growth of children is determined by biological and environmental factors. Growth is an active, dynamic process involving ceaseless change. The experiences which children have determine the nature and course of subsequent experiences.

Growth is the unifying scientific concept that is used by all students of child development.

Growth is dependent upon the proper interaction of many factors such as the environment, the endocrine secretions, health, maturation and education.

The terms Growth and Development are often used interchangeably but it is useful to learn the finer differences between them. Growth is quantitative. It involves the multiplication of cells, like growth in height, weight, intelligence etc., whereas development is qualitative. It includes not only growth but also changes in the nature and composition of structure and organs. It may be regarded as an organization of all the parts which growth and differentiation have produced. In other words, growth may be referred to describe the changes which take place in particular aspects of the body and behaviour, while the term development may be used with reference to the organism as a whole.

Characteristics of Growth

1. Both growth and development usually take place gradually.

2. Also the order of growth and development is sequential. Sequences have been found to be relatively constant in some areas which have been intensively studied *e.g.*, grasping, walking etc. Studies in motor sequences have clearly shown that a child sits before he stands, that he stands before he walks and that he walks before he runs.

3. Growth, however, is not uniform in all individuals. Studies have shown that, while there is a regular sequence in the growth of the several aspects, still each child has his own individual growth pattern.

4. Growth does not proceed at a uniform and steady rate. Although growth is continuous, it may be somewhat more rapid at certain stages than at others *e.g.*, the child grows in height more rapidly during the first year of his life than at any subsequent one year period. Similarly, there is a rapid increase in vocabulary from two and a half to three years of age. Smith has shown that while the child of one year may speak three words, by two years he can use 272 words and by three years 896 words !

5. We must also note that it is not possible to predict growth in one aspect from the knowledge of the rate of growth in another aspect. Thus, a child may grow very fast mentally but may be below the normal for his age physically and socially.

6. Growth in experience is as important as growth in height, weight or intelligence. When adequate experience is lacking and when growth in the social and emotional aspects is not satisfactory the individual will not feel equal to the demands of the circumstances of his life.

7. Finally, growth may meet with checks. It may be retarded by childhood diseases, emotional shocks and other unhappy early experiences. The course of subsequent development will be conditioned by these early experiences in life. Since growth is most rapid during the early years of life, if the child is provided with situations which afford the proper type of experiences, he will grow properly. Of course, these experiences ought to take into account the stage of development of the child, his health, maturation etc.

Every individual is a product of both the heredity and environment and the individual differences that we observe must be attributed to both heredity and environment.

Heredity provides the basic raw material ; to what extent the potentialities of the individul will develop depends upon the environment. So society should concentrate its efforts on providing better food, better homes, better education, better working conditions and better recreational facilities for every one in order that the population as a whole could be improved.

Physical Growth and Development

There are five phases of physical growth :

(1) The pre-natal period.
(2) The first two years of rapid growth.
(3) The steady growth period from the age of two to the age of twelve or thirteen years (to the beginning of the adolescent spurt).
(4) The adolescent spurt to about fifteen or sixteen years
(5) The decreasing growth to the age of about twenty.

A child should be at a weight that is most healthful for him. If a child is in the lightest or heaviest 10 or 15 per cent for his age and height, a doctor should be consulted.

The brain and body grow and develop with the increase in age and thus the mental and physical capacity of the child increases.

In adulthood the body proportions are different from those in childhood, the head being proportionately only one-half as large, the torso being the same, but the legs being proportionately one-third longer. Body proportions may have emotional consequences.

Children should get a proper and well-balanced diet, enough exercise and rest in order to achieve maximum health. Too sternuous exercise and fatigue should be avoided. Good nutrition seems to have a good effect on the temperament.

A child obtains increasing physical power and capacity for skills from the physical growth and development that accompany the process of becoming older. This is maturing.

The adult size of a son can be estimated by averaging the father's height and 110 per cent of the mother's height. For a daughter take the average of the mother's height and 92 percent of the father's height. Account should also be taken of maturity of wrist bones and the size of the grand parents.

Size, strength, thinness, fatness, and general physical development may affect personality favourably or unfavourably. A person should eat and take exercise in a healthful way so that he may achieve the best possible physical development. Personality and character cannot be judged from body type and physical appearance.

The brain grows most rapidly during the first five or six years of life, after which it increases slowly until maturity is reached at the age of about twenty. The sex organs (genitals) grow slowly until about the age of twelve or thirteen when they develop rapidly to the age of twenty. Puberty is the beginning of adolescence and of rapid sexual development. Adolescence is the period of the teens and is the stage between childhood, and adulthood. Girls mature a little earlier, or reach puberty a little younger, than do boys. They are also bigger for two or three years, after that boys more than catch up with them. This has social implications.

Mental Growth and Development

Comparable with the increase in

physical power that accompanies general growth, there is an increase in mental power that accompanies increase in age until maturity is reached. The nervous system grows, and this is the basis of increasing intelligence which develops through education and experience.

One of the indexes to growth of intelligence is increase in vocabulary, which has two phases, words used and words correctly recognised. Increase in vocabulary in general is characteristic of mental growth and reaches its peak in the twenties, although it is possible that vocabulary ability increases slightly throughout most of adult life.

Memory, which is a basic element in intelligence also develops steadily in a manner characteristic of mental gro th and reaches maturity in the late teens or early twenties.

Another index to the development of intelligence is the development of thinking through the stages of enumeration, description and interpretation.

The above are indexes of mental growth because they indicate increasing powers of perception, memory imagination, and reasoning or problem solving.

A person has mental or learning readiness for tasks when he has grown and developed to a level where he has the potentiality and capacity to learn these tasks readily. The concept of mental readiness should be interpreted in terms of maturing and experience. Mental maturing is the growth and development that results from the growth of structures and experience. Mental maturity is the stage reached when growth stops, usually after the first twenty years of life.

General mental growth is most rapid in the first five years of life, nearly as rapid from ages five to ten, less so, from ten to fifteen and much less so from fifteen to twenty. Natural mental growth probably stops at about the age of twenty. Bright children develop much faster than dull children and reach a much higher level at maturity. The bright probably develop over a little longer period than do the dull ones.

It is interesting to study the course of mental capacity after adulthood is reached. Some studies indicate that, beginning in the late twenties, mental abilities decline ; others that mental capacity declines very little, if at all, until well past the middle age. The golden years of life are probably between the ages of twenty and forty.

The adult years are good years for professional and personal development and should be utilized to achieve maximum proficiency and happiness.

Social Growth and Development

Social growth consists in improving ones personal relationships, in learning how to get along with other people.

Physical and mental growth contribute to social development in giving a person more capacity for dealing effectively with social situations.

Physical and mental weaknesses and defects tend to maladjust a person.

A child is very individualistic in early childhood, but living with people socializes him.

Experiences in home or school develop feelings, attitudes and habits that either help or block social maturing.

A person who is self-centred, egocentric or introverted, in that sense cannot be a socially mature person. To be truly socialized one must be outgoing and interested in other people.

Leadership is an evidence of social maturity. Students who are school leaders tend to be better students, of higher intelligence level, with more attractive physique with good workr habits, are successful in extracurricula activities and have a higher socio-economic status.

Home and school environments can make a child feel frustrated, resentful, over dependent, inferior and insecure in many ways, or just the opposite.

A number of factors contribute to the formation of friendship, such as being in the same class and living in the same neighbourhood.

Personal factors are similarity of mental abilities, age, recreational interests, socio-economic status and religion. Also, extroverts favour extroverts and introverts favour introverts. Several of these factors tend to be interrelated.

In school, children are accepted or rejected by others. Some pupils enjoy wide acceptance while others are unpopular. Teachers should help the rejected ones to gain greater acceptance.

Characteristics of a socially mature person

The socially mature person

1. has a capacity for friendship and rarely makes enemies. He has friends and likes to be with people.

2 has a good control over his emotions, a pleasant disposition and a tolerant and understanding attitude. He rarely shows offensive feelings or aggressive behaviour.

3. has a power of leadership. This power shows itself in early childhood and becomes stronger as the person grows older.

4. has the ability and desire to co-operate with others. While leading in some spheres he should be equally willing to co-operate and follow the leadership in other spheres.

5. learns to become economically independent. The desire to become economically independent shows itself during the teens and should be pursued.

6. becomes weaned away, from the parental roof and establishes his own home and family. This parallels the achievement of economic independence.

7. has play interests and engages in recreational activities suitable to his age.

8. lives according to high social and moral standards and is not delinquent.

9. is mannerly, courteous and gentle in personal relationships.

10. achieves good heterosexual relationships and gets along well with members of the opposite sex.

Summary

It is necessary to study the growth and development of the body in order to understand and explain the behaviour of an individual. Behaviour is the product of organic and environmental factors which work hand in hand. Growth is an active dynamic process involving ceaseless change. It is dependent upon the proper interaction of many factors such as the environment, the endocrine secretions, health, maturation and education. Growth is qualitative. It involves the multiplication of cells, like growth in height, weight, intelligence etc., whereas development is quantitative. It includes not only growth but also changes in the nature and composition of structures and organs. While growth is used to refer to changes in particular aspects of the body and behaviour, development refers to the organism as a whole. Both growth and development take place gradually and are sequential. Growth is not uniform in all individuals nor does it proceed at a uniform and steady rate. It is not possible to predict growth in one aspect from the knowledge of the rate of growth in another aspect. Growth in experience is as important as growth in height, weight etc. Growth may meet with checks.

There are five phases of physical growth : (1) The *prenatal* period, (2) The first two years of rapid growth : (3) The steady growth period from two to thirteen years ; (4) The adolescent spurt to about fifteen-sixteen years ; (5) The decreasing growth to the age of about twenty. A child should be at a weight that is most healthful for him. Children should eat a proper and well-balanced diet, get enough exercise and rest, in order to achieve the best possible physical development.

Just as there is an increase in physical power with general growth, there is an increase in mental power that accompanies increase in age until maturity is reached. The mental growth manifests itself through increase in intelligence, vocabulary, memory, gower of thinking and problem solving.

Social growth consists in improving one's personal relationships by learning how to get along with other people. Socially mature persons are those who can make friends, who are leaders, who have good emotional control, who co-operate with others, who become economically and socially independent, who have wholesome recreational interests, who maintain high moral standards, who have good manners, and who get along well with members of the opposite sex.

I. Essay Type and Short-Answer Questions

1. Why do we need to study the growth and development of the body ?
2. Mention two important differences between growth and development.
3. List some important characteristics of growth.
4. Which are the factors that affect growth ?
5. What are some of the characteristics of mental growth ?
6. How would you identify a socially mature person ?

II. Objective Type Questions

(*a*) Fill in the blanks with suitable words.

1. Growth is an active.....process involving ceaseless change.
2. Growth is.....whereas development is.....

3. The order of growth and development .....
4. Growth is not.....in all individuals.
5. Growth in.....is as important as growth in height or weight.
6. Every individual is a product of both the.....and environment.
7. One of the indexes to growth of intelligence is increase in.....
8. The concept of mental readiness should be interpreted in terms of .....and experience.

(*b*) In the following statements put a tick (√) mark against those you think to be correct and a cross (×) mark against those you think to be wrong :

1. Socially mature persons cannot make friends easily. ( )
2. A child should be at a weight most healthful for him. ( )
3. All children are accepted well by others in school. ( )
4. Physical and mental growth contribute to social development. ( )
5. General mental growth is most rapid in the first five years of life. ( )
6. It is possible to predict growth in one aspect from the knowledge of the rate of growth in another aspect. ( )
7. During adolescence girls mature earlier than boys. ( )
8. Home and school environments do not affect the growth and development of a child. ( )

Activity

Teachers may ask pupils to list the names of other pupils they would like to work with or play with and then prepare a sociogram on the basis of these choices. The pupils who are not popular should then be helped to gain social acceptability of the group.

□

CHAPTER 8

Healthy Behaviour and Personal Adjustment

The basic human wants, drives and urges that motivate most human behaviour are those for life and economic and social security ; personal worth ; health, comfort and avoidance of pain ; stimulation and activity ; individualism and freedom ; and the satisfaction of the sex urge.

The teacher, in guiding the learning and personal development of his pupils, must control the school situations for meeting these needs and wants, in order to stimulate maximum growth and development.

A person is frustrated and maladjusted when his basic wants are not satisfied and unhealthy emotions develop. Consequently, when students do not respond wholesomely to a situation, the teacher should make changes that will result in satisfaction.

When a person is happy and satisfied in his environment, he will be in good mental health. A pupil should fit the work he has to do, and the work should be such that the pupil can succeed and made progress.

Following a well-organized programme of work, play and rest is conducive to better mental health. Irregularity, procrastination, uncertainty and conflict contribute to maladjustment and in fact are symptoms of maladjustment.

If a child is shy, over-aggressive, or in general ineffective in his relationship with others, he should be skillfully guided into social activities and helped to make a good adjustment.

A person's mental health will probably improve if he faces his difficulties squarely and discusses them fully. He should also develop competence and interest in a number of activities including his work. Further he should have a knowledge of the principles of mental health which he should try to apply to his day-to-day living.

Characteristics of Mental and Emotional Health

A mentally and emotionally healthy person shows the following traits :

(1) Good physical health.

(2) Happy personal and social relationships.

(3) Orderly and effective work habits.

(4) A realistic approach to problems and situations.

(5) Balanced and orderly living.

(6) A healthful outlook and a wholesome philosophy.

In addition, a child or an adult who is getting along well shows further marks of good adjustment as follows :

1. He is relatively free of worry, anxiety and other tensions.

2. He is calm and self-possessed.

3. He possesses confidence, self-respect, and a feeling of worth but shows wholesome humility.

4. He shows tolerance and self-control.

5. He has convictions on what is good or bad, right or wrong and works consistently for what he thinks is good.

Having studied the structure and functions of the human systems and the physical, mental and social growth and development of the human body, we are now in a position to realize that no two people are alike physically, mentally or emotionally.

Young adults also differ in physical, mental and social growth rates. In early adolescence the range of individual differences in body development is greater than at any other time.

It is very important for each one of us to realize that it is our prime duty and responsibility to maintain ourselves in good physical, mental and emotional health. Good health is a means towards achieving a happy and successful life.

In order to lead successful and happy lives we should also become familiar with the concept of developmental tasks for each age group. According to Havighurst : "A developmental task is a task which arises at or about a certain period in the life of an individual, successful achievement of which leads to his happiness and to success with later tasks ; while faiure leads to unhappiness in the individual, disapproval by the society and difficulty with later tasks." Simply stated, it means the behaviour and skills an individual is expected to acquire at a particular age and level of development.

Developmental Tasks of Adolescence

Adolescence is a period of rapid physical growth and sexual development. It is a time of stress and strain for many. The teenagers feel and try to act like grown ups though they lack the mental and social maturity for doing so. There are often conflicts and misunderstandings with elders, parents and teachers, when the teenagers try to assert their independence. Adolescents also get easily bored and easily upset. They tend to get carried away by their momentary feelings The influence of friends is also very great at this age and so also is the interest in the members of the opposite sex.

Yet, adolescence need not be a

period of turmoil. What adolescents need is affection, understanding and guidance in solving their problems. They also need to have a regular routine of good diet, physical activity, enough rest and sleep and many hobbies. They should have outlets to direct their extra energy and creative talents into activities like music, art, painting, athletics, swimming and other kinds of sports. They should also get enough opportunities to meet friends of both sexes. Then they develop self-confidence and social maturity.

The Development tasks of Adolescence are as follows :

1. To develop and achieve new and more mature relationships with agemates of both the sexes.

2. To learn to behave as an adult among adults so that he can work with others for a common purpose.

3. To learn to lead without dominating and to follow without bickering.

4. To have affection for parents without dependence upon them. He or she has to learn to wean himself away from the parental strings.

5. To have respect for elders, again without dependence on them, He or she has to gradually learn to become independent.

6. To select and prepare for an occupation and thus become economically independent. The school should provide adequate vocational guidance.

7. To prepare for marriage and family life. This is a very important sphere where adolescents need proper guidance. Parents and other social agencies should provide this.

8. To develop intellectual skills and concepts necessary for civic competence. He has to learn to become a good citizen by developing concepts of law, government, economics, social institutions, etc.

9. To develop language skills and reasoning ability for dealing effectively with human beings.

Developmental Tasks of Adulthood

(*a*) Early Adulthood (20-30 years)

1. A young adult has to learn to manage the house. He marries and sets up his own home at this period.

2. He has to get himself firmly established in a job to his liking.

3. He has to learn to become a full citizen and discharge his civic responsibilities.

4. He also has to learn to find a congenial social group by becoming a member of some club or social service league or some other voluntary organization.

5. He has to start a family and learn to play the role of a responsible young parent.

(*b*) Middle Age (30-60 years)

1. A mature adult has the task of maintaining and improving the economic standard of living.

2. He or she has to guide his children through childhood and

adolescence to enable them to become responsible in due course and happy adults.

3. He has to develop some wholesome leisure time activities.

4. As the individual grows older his neuro-muscular strength decreases ; so an older adult has to learn to adjust himself or herself to these physiological changes of middle age.

5. He also has to learn to make suitable adjustments with his old parents.

6. He has to make provision for his old age.

(e) Later Maturity or Old Age (60-75 years)

1. The older adult has to learn to adjust to retirement and to reduced income.

2. He has to further adjust to the aging process particularly in the cardio-vascular system, the kidneys and the joints.

3. He must learn to become affiliated with the people of his own age group.

4. He should not lose interest in life but continue to keep abreast with the times.

5. He should look after his health, take a light wholesome diet, enough rest and exercise and keep up some absorbing activity.

6. He should not interfere with the affairs of his children and neighbours and give advice only when asked for.

7. He should devote some time to matters of the spirit and self-realization.

In sum, we can say that an individual has a duty to maintain himself in good physical, mental and emotional health. He should assess his own capabilities and choose a profession commensurate with his ability and liking. He should also develop wholesome hobbies and leisure time interests. A healthy and a happy man would be in a better position to discharge his responsibilities towards his children and other members of his family.

Finally, he should do his bit towards improving the health of his family and community.

Preparation for Marriage and family responsibilities.

It is very important for young people to develop correct attitudes about family life, marriage, babies, their own bodies, the way love is expressed and toward members of the opposite sex. Sound attitudes in such matters encourage sexual conduct that brings the rewards of self-respect, the likelihood of mutual happiness in marriage, and a healthy family life.

The attitudes that parents and other adults in contact with children have about sex are catching. Whether grown up people look upon sex as a great creative force in life, or as something not to be talked about, or as a topic for dubious jokes, the children in their care are likely to reflect the same point of view. In sex education, the sharing of attitudes and

feelings is as important as the sharing of information. Consequently, adults need to be alive to their own feelings about sex as they guide the youngsters for whom they are responsible.

The home is the ideal place for telling the story of life, because parents have a continuing relationship with their children on this subject. They are the ones who care most about their children, and who provide a buffer between them and the outside world. In many homes parents provide excellent guidance in the sex education of their children. In others, parents want to give such guidance, but seem unable to do so and need the help of the school or other social agencies of the community.

Feelings and attitudes that are significant in the child's sexual development begin to form very early in life, almost at birth. The child's parents and his home environment influence such attitudes first of all; playmates, the neighbourhood, school and community exert their influence as he grows older. These attitudes usually last over many years and will affect his own approach to love, marriage, and family life.

The basic core to sex education is the continued, reassuring love or friendship that parents, teachers and youth leaders give to the children under their guidance. The love of a husband and wife for each other and their children is the very essence of good sex education. In a home where such love is abundant, the baby or your child soon takes the first steps towards being able to give love in return. He first loves his mother, father and other members of the family. He later learns to love his playmates, teachers, special friends and is finally ready for the love that leads to marriage and parenthood. But if the baby or young child is not loved, it will be difficult for him to learn to give love.

Adults should realize that a dependable, useful love does not mean that they must never direct or control the children or youth in their care. Instead, through a mature kind of love adults should help young people to form standards of good conduct and to develop the inner resources to live by those standards. They should be able to help youth to form values which will enable them to make wise choices.

These days children and adolescents are exposed to a lot of undesireable and sensational material concerning sex through the television, radio, movies, newspapers and picture magazines. The young mind gets bewildered through the impact of these experiences. It is very important, therefore, that children and youth should have the support that comes from a happy family life, from sound sex attitudes and information at home and at school, and from wholesome opportunities to work and play with companions of both sexes.

Young people today have greater freedom, and there are many more opportunities for the two sexes to be together without adult supervision.

This present-day freedom imposes upon adults an obligation to educate young people to use their freedom wisely, so that youth will accept greater responsibility for basing their own actions on sound ethical principles.

Sex education should begin long before young people, reach the age of 16. It should continue in relation to matters that particulary concern this age group, although there will be many young people who by now will consider their sex education complete and will not bother to seek further information.

The late teens and early twenties are the years when many young men and women fall in love and so it is the time when questions of sexual conduct are urgent. Young people must make decisions about how intimate they will be, knowing that some young people indulge in premarital intercourse, they are faced with decisions about their own course of action.

This is the age for preparation for marriage and much valuable ground can be covered if the young people have opportunities to discuss and learn what is necessary for a successful marriage. Many young people need to outgrow their rather immature preoccupation with the glamorous aspects of being engaged. They need to learn, before hand, that happiness and permanence in marriage can be strengthened if the young marriage partners are able to make adjustments with regard to matters like finances, jobs and relationships with each others friends and relatives. Some young people need to learn that though sexual adjustments are very important, they do not constitute the whole of happiness in marriage. They also need to adjust to the differences in age, religion, education and social background of their marriage partners. It is very important at this time for young people to achieve a greater understanding of themselves and their relationships with other people.

Young men and women also need some flexibility in their ideas about the proper role of men and women. Nowadays, when so many women work because they need to, both the young man and the young woman should be able to think clearly, about how this affects the husband and wife relationship and also how a young wife may be a successful mother if she continues to work.

It has been found that while some young adults may seem to shirk responsibility, most are self-sufficient and capable of building the kind of life that will make them happy and successful parents.

Summary

Human behaviour is motivated by the basic human wants, drives and urges. A pe son is frustrated when his basic wants are not satisfied. When a person is happy and satisfied in his environment, he will be in good mental health.

Adolescence is a period of rapid physical growth and sexual development. Adolescents need affection, understanding and guidance in solving their problems. They also need to have a regular routine of good diet, physical activity, enough rest and sleep and many outlets for their extra energy and creative talents.

Every individual has a duty to maintain himself in good physical, mental and emotional health in order to be able to discharge his duties towards his family and lead a happy and successful life.

I. Essay Type Short-Answer Questions

1. What are the basic human wants ?
2. When does a person get frustrated ?
3. List some of the changes that the body undergoes during adolescence.
4. Suggest some suitable outlets for the extra energy and talents of adolescents.
5. Give the importance of marriage and family responsibility for the young.

II. Objective Type Questions

(*a*) In the following statements fill in the blanks with suitable words :

1. Adolescence is a period of rapid..... growth, and.....development.
2. Economic and.....security are very important for an individual.
3. A person is.....when his basic wants are not satisfied.
4. A pupil should.....the work he has to do.
5. A person's mental health will improve if he faces his difficulties.....and discusses them.
6. A balanced and .....living leads to good mental health.
7. A well-adjusted person is relatively free of.....and other.....
8. Adolescents get easily.....and upset.
9. Adolescents should get opportunities to meet.....of both.....
10. An adolescent has to select and..... for an.....and thus become economically.....

(*b*) In the following statements put a tick (√) mark against those you think to be correct and a cross (×) against those you think to be wrong :

1. An adolescent should have affection for parents without dependence on them. ( )
2. A young adult need not worry about his family life. ( )
3. As an individual grows older, his neuro-muscular strength increases. ( )
4. A middle-aged person need not worry about his old age. ( )
5. An older adult should have an absorbing activity to keep him happy. ( )
6. Parents should not interfere with the affairs of their grown-up children. ( )
7. A healthy and happy man can discharge his duties better. ( )
8. The aging process involves the cardiovascular system, the kidneys and the joints. ( )
9. Schools need not worry about giving vocational guidance. ( )
10. An adolescent has to learn to become a good citizen. ( )

"Animals feed ; Man eats. Only the man of intellect and judgement knows how to eat."

—Brillat Savarin

Food and Nutrition

Introduction

The most precious gift anyone can ask for is good health and this depends mainly on the food we eat. *What is food* ? It is a substance which produces heat and energy in the body, builds and repairs tissues. It also contains some roughage which adds quantity or bulk to the diet. *What is Nutrition* ? It is the process by which the body uses food to repair tissues and carry on its other activities. The study of nutrition concerns the foods which the body needs, organs which digest them, blood which carries the digested food to the tissues and the ways in which this is used by the body.

CHAPTER 9

Factors Affecting Nutritional Status of an Individual

There are various factors which affect the nutrition of an individual. These are Heredity, Environment, Family Economy, Rest, Sleep, Relaxation and Exercise.

1. **Heredity.** It means the passing on to the offspring or children not only the characters or traits of parents but also a weak constitution. This is due to the faulty diet of the mother during pregnancy.

2. **Environment.** Early man ate whatever food was found in his surroundings or environment in order to satisfy hunger. With early or primitive man, carnivorous food was popular. Fruits and nuts also formed part of his diet. The seeds of these were thrown and the seedlings which sprouted from them, formed the basis of early agriculture. Later root vegetables like Tapioca, Cassava became the staple diet. The type of food eaten depended on the climate, soil, water and local agricultural practices in the environment.

(*a*) *Physical* conditions depend mostly upon the climate, character or nature of food and on the survival of man. The food natural to a temperate climate causes less physical strain and facilitates digestion. There is also a greater scope for a better appetite owing to the climate. This helps in physical development and growth. In the tropics the climate does not allow for much general progress in Man. Thus man's food and food habits have been adapted to the physical environment in which he lives. If these environmental conditions are bad then suitable adaptations have to be made. These depend upon the locally available sources of food. Otherwise suitable food substitutes should be used instead.

(*b*) *Religious Values* were attributed to food as different religions forbade the eating of certain foods. In the Middle East *bread* is a symbol of religious ceremonies. The Indians of Mexico use *corn* as staple food and this is also based on religion. *Pork* is not eaten by the orthodox Jews and Muslims. Buddhists and Jains are *vegetarians* since they do not eat the

flesh of any animal. Hindus hold the cow sacred and so do not eat *beef*.

Fasting is common to all religions irrespective of caste and creed and it forms a symbol of religious rites and attitudes.

(*c*) *Socio-cultural.* It has been pointed out that what one eats depends upon one's culture. Food habits may have existed among a given racial group for centuries. So this may be the reason why people are reluctant to accept a change in food habits. These show the social make-up, economy, religion, beliefs, food values and their attitudes towards various members of the family. Meal patterns depend on culture. Today changes in food patterns may be accepted only if they do not clash with the old forms and blend well with them. This should be a good thing for it is a source of enriching rather than doing away with the old forms. As for social values to "break bread" has been an act of friendship from times immemorial So one entertains friends with food during a visit. Even a stranger is invited to share food. When food is served to guests it is always the best and so also the table appointments. To eat together provides friendly relaxation and conversation. During big dinners, to be placed at the head of the table or at sea at the Captain's table shows social distinction. In some societies women are considered to be inferior and have to wait till the men and boys have finished their meals.

(*d*) *Emotional conditions provided by food.* It is a well known fact that eating provides an outlet for the stress and strain of life like a difficult examination in school makes a child eat less or not at all. A homely adolescent with no friends tries to make up by concentrating more on food and thereby satisfying his ego.

Food is also a sign of security to many, for example a baby feels secure in the arms of its mother when it drinks milk. Milk is generally refused by older children to show perhaps a feeling of independence not wanting to be treated like a baby. Food can be used as a weapon when an insecure child refuses to eat and the mother becomes concerned. Children who are ill and lonely may make demands of food upon those caring for them, just to gain attention. Food may be used as a bribe to get something done by children or it may be used as a punishment by refusing to give a child its favourite food for some misdeed. The thought, sight and flavour of certain foods increase the flow of saliva in the mouth and cause a better appetite. A person who is happy and secure eats better and thoroughly enjoys his food.

3. **Family Economy.** Today's housewife has more money to spend. She spends less time in the preparation of food. Yet she serves better meals than at any time in history. She has a better education, enjoys more leisure than her mother did. So she can work and plan the menu carefully,

shop for quality, brand, nutritive value, price, convenience and variety. During a single year each teenager or adolescent and adult in a family can spend about one-fifth of the family income on food alone.

It has been considered that today's foods are wholesome, nutritious and varied. The cost of food is higher than it was ten years ago. Incomes have also risen hence one hour of a man's labour today can buy more food than ten years ago. The prices of food make it the largest single item in the budget of most families. It varies under different conditions. One can be adequately nourished even with simple and cheap food. If the income is low, careful planning is required to make the diet interesting and nutritive.

The amount of money required for food depends on the size of the family, number of children and their ages, activities of the various members, special needs for pregnancy, lactation and illness. The cost of food is influenced by choice of food within each group and preparation of food.

The rules for effecting economy may be considered as follows :

(1) Plan meals for several days at a time.

(2) List out the foods required to be bought.

(3) Use food substitutes which are nutritive but cheaper.

(4) Avoid eating luxury foods such as chocolates, cakes and pastries.

(5) Avoid buying food on impulse.

(6) Buy such food which the family will eat.

(7) Compare the prices of various foods before buying them and keep a record of the prices.

(8) Use foods when fresh so that the vitamin content is not lost.

(9) Eat meals at home or carry food to work because meals in restaurants or hotels are expensive.

(10) Buy large amounts of food only if storage is possible.

(11) Read advertisements for special foods.

(12) Choose from the five basic food groups as basis for good meal-planning, the food groups being the Milk group, Cereal group, Meat group ; and the Vegetable group and the Oil group.

(4) Rest, Sleep and Relaxation. Fatigue or extreme tiredness may be muscular or nervous. This is

Fig. 8.1—Play

because the chemical products of oxidation are not removed fast enough by the blood and not because carbohydrates in the muscles have been oxidised and used up. The cure for fatigue is *Rest*. During rest, the harmful products formed due to muscle and nerve activity are removed by the blood as quickly as they are being produced. The tissues are then being repaired and made ready for further activity. So it is better to lie down to rest, in order to give rest to the heart. The best form of rest is sound *sleep*. During sleep the body gets complete

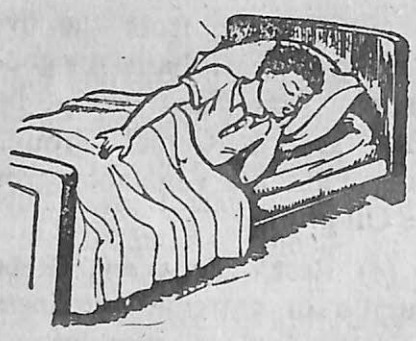


Fig. 8.2—Sleep

rest. The muscles relax, the heart beats more slowly and breathing becomes slow. In the tropics adults require eight hours of sound sleep. Younger children need about eleven to thirteen hours of sleep. Adolscents require nine to ten hours of sleep. *Relaxation* means to slacken one's self from any form of action. In a sense it is to be free from individual pressures of work. During this time *Recreation* or amusement in the form of physical educa-

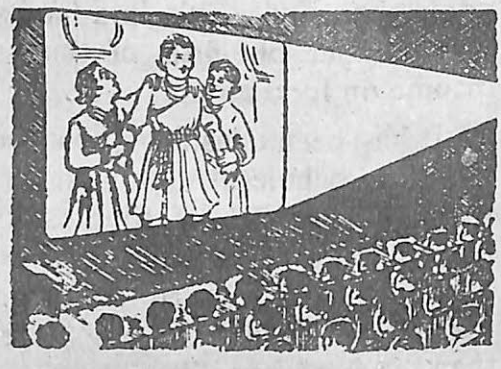


Fig. 8.3—Recreation

tion, art, music, drama, social dancing, television, a walk, or a drive are helpful. Complete leisure causes boredom. Work and effort are necessary to a normal pattern of life. Relaxation and effort if balanced keeps one fit.

5. **Exercise.** This means the activity of muscles. This causes quick combustion of food in the tissues of the body. As a result of this, excretion of carbon dioxide and water and release of heat and energy occurs. Exercise produces appetite and thirst. So water and carbohydrates are needed to supply the requirements. An increased in-take of proteins replaces worn-out tissues and the organs of the body work more effectively. Exercise also produces regular action of the bowels and prevents constipation.

Summary

There are various factors effecting the nutritional status of an individual. These emerge from the physical, economic and socio-cultural environment. As a result of this, there exists amongst individuals the problem of under-nutrition. This leads to bad health and disturbed family life affecting national prosperity. Heredity or Inheritance plays a role in the physical condition

of an individual. Besides nutrition, other factors responsible for good health are exercise, rest, sleep and relaxation.

I. Essay-Type and Short-Answer Questions

1. Define the terms Food, Nutrition and Roughage.

2. Mention briefly the factors which affect the nutrition of an individual.

3. Explain the role of the environment in the nutritional status of an individual.

4. Why do you consider that family economy affects national prosperity ?

5. What is the necessity for Rest, Sleep and Relaxation ?

6. Why is exercise required for good health ?

II. Objective Type Questions

(*a*) Fill in the blanks :

1. Heredity or.....affects the nutritional status of an individual.

2. Hindus hold the cow sacred and so do not eat.....

3. .....is a symbol of religious ceremonies in the Middle East.

4. Muslims do not eat.....on religious grounds.

5. Jains are.....

6. Meal patterns depend on.....

7. The thought of certain types of food makes.....flow in the mouth.

8. A happy person.....his food.

(*b*) Place the number of the term in column B against the idea it expresses in column A.

Column A	*Column B*
...To slacken from any form of action	1. Roughage.
...It adds quantity or bulk to the diet	2. Heredity.
...The passing of characters from parents to offspring	3. To "break bread"
...any form of amusement	4. Recreation.
...This shows an act of friendship	5. Relaxation.

(*c*) *True-False* : Mark true statements (√), mark false statements (×) :

1. The study of nutrition concerns the foods which the body needs ( )

2. Primitive Man ate anything in the environment to satisfy his hunger.

3. Fasting is common to all religions. ( )

4. Our eating habits depend on our culture.

5. Food served to guests should be inferior in quality. ( )

6. More money is spent on food than on anything else.

7. Complete leisure should be recommended for all.

8. Roughage prevents constipation in the body.

(*d*) Project :

1. List out the types of muscular activities performed by you.

2. Write out the five *Food Groups* : Milk Group, Cereal Group, Meat Group, Vegetable-Fruit Group and Fats and Oil Group in five different columns. List out under each group the various foods you generally eat belonging to them.

□

CHAPTER 10

The Nutritive Components of Food

The body needs materials which it can use for heat and energy, body-building, repair of worn-out tissues, regulation of body processes and protection against diseases.

These materials are provided in the food we eat and are known as the *Nutrients*. There is no one food which contains every nutrient in the correct amount needed by the body. It is therefore important that a variety of foods should be eaten every day even though most foods contain more than one nutrient.

Classification of the Nutrients in Foods

These nutrients are classified as follows :

(*a*) According to *Chemical composition*, food is divided into six main groups namely :

(1) Carbohydrates

(2) Fats

(3) Proteins

(4) Mineral Salts

(5) Water.

(6) Vitamins

(*b*) According to the *Functional Classification*, food consists of :

(1) Heat and Energy yielding foods including Carbohydrates and Fats.

(2) Body Builders including the Proteins and Mineral Salts.

(3) Protective Foods including Water and the Vitamins.

The following tables give details regarding the above-named nutrients required by the body :

HEAT AND EN ERGY PRODUCERS

S.No.	Class of Food	Elements	Sources	Uses
A.	Carbohydrates	Carbon, Hydrogen and Oxygen. Hydrogen and Oxygen combine to form water and are in the ratio 2 : 1	(1) Starches—common examples are : (*a*) *Cereals* Rice, Whsat, Maize and Barley. (*b*) *Root Vegetable* Turnip, Arrowroot and Tapioca. (*c*) *Stem Vegetables* Potato, Yam, Colocasia, **Sugars :** *Simple Sugars* : Glucose or Grape Sugar. Fructose or Fruit sugar. *Complex Sugars* : Sucrose or Cane sugar. Lactose of Milk sugar. Mannose or Beet sugar. Maltose or Malt sugar.	1. Required for quick supplies of energy to the body. 2. Produce heat in the body. 3. Are cheaper than fats. 4. Help in the complete oxidation of fats.
B.	Fats	Carbon, Hydrogen and Oxygen but Hydrogen and Oxygen do not combine to form water.	(1) **Animal Fats** Meet, Egg-Yolk, Fish, Milk, Butter and Ghee. (2) **Vegetable Fats** Mustard Oil, Coconut Oil.	1. Supply more energy to the body than any other food. 2. Make the body tissues firm. 3. Prevent loss of heat from the body. 4. Protect delicate organs from injury.

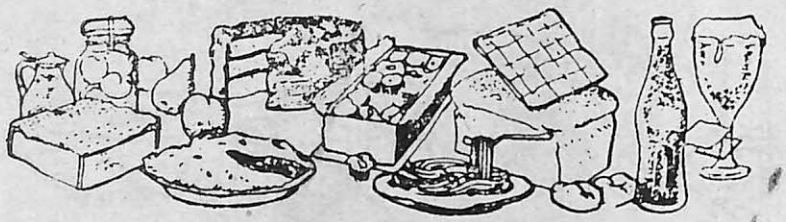


Fig. 10.1—Foods rich in Carbohydrates

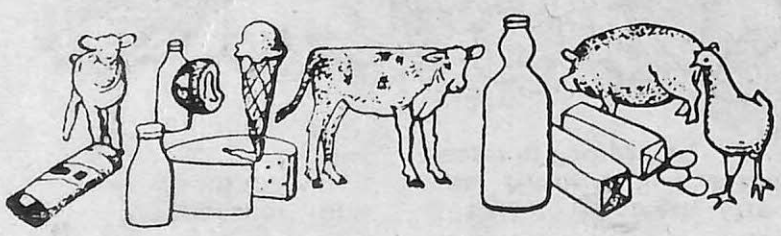
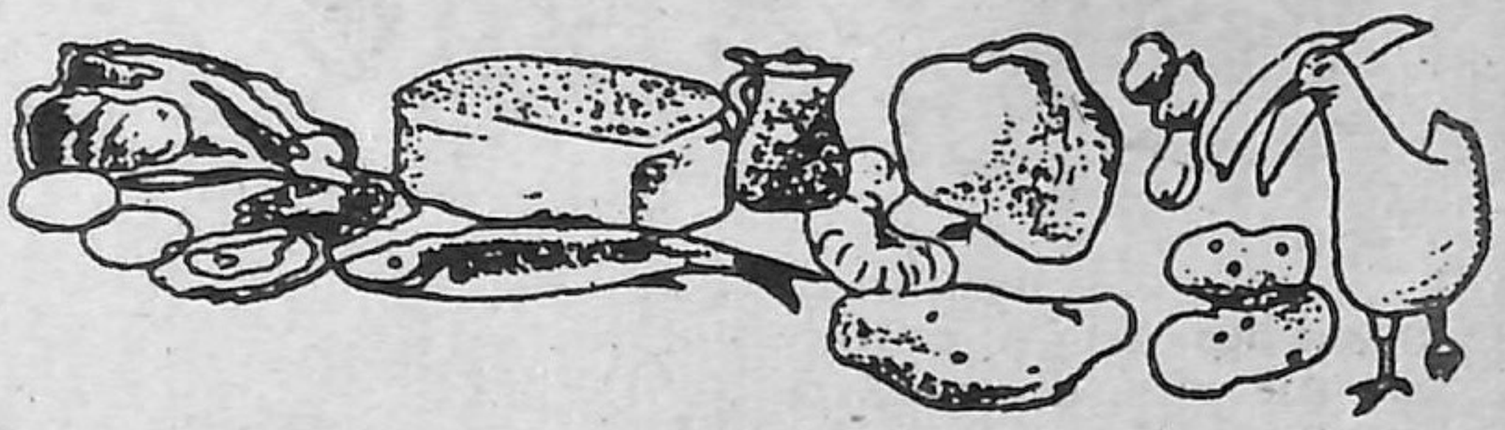


Fig. 10.2—Foods rich in Proteins and Fats

S.No.	Class of food	Elements	Sources	Uses
C.	Proteins or Nitrogenous foods.	Carbon, Hydrogen, Oxygen, Nitrogen, Sulphur and traces of Phosphorus.	1. **Animal Proteins** Albumin in Egg-white Myosin in meat. Glutenin in Wheat. —Casein Milk, Curd and Cheese. 2. **Vegetable Proteins** Legumin in Peas, beans and lentils or dals.	1. Build up tissues in the body. 2. Repair the worn-out tissues of the body. 3 In excess are a source of fat in the body. 4. Produce heat in the body.



10.3—Some more foods containing Proteins

D.	Mineral Salts or Trace elements.	1. Calcium	Cheese, Curd, Milk, Egg, Nuts and Green Vegetables.	1. Helps the blood to clot. 2. Builds up bones and healthy teeth when combined with phosphorus to form calcium phosphate.

10.4—Foods rich in Calcium

2. Phosphorus	Milk, Egg, Fish, Cheese, Beans and Nuts.	Builds up bones and healthy teeth when combined with calcium to form calcium phosphate.
3. Sulphur	Milk, Egg, Fish, Cheese, Beans, and Nuts.	It is required for building proteins and vitamins.
4. Iron	Egg, Liver, Dals, Cucumber. Onion, Spinach, Tomato. Whole Wheat.	Helps the blood to carry oxygen to the tissues by forming haemoglobin.

S.No.	*Class of food*	*Elements*	*Sources*	*Uses*

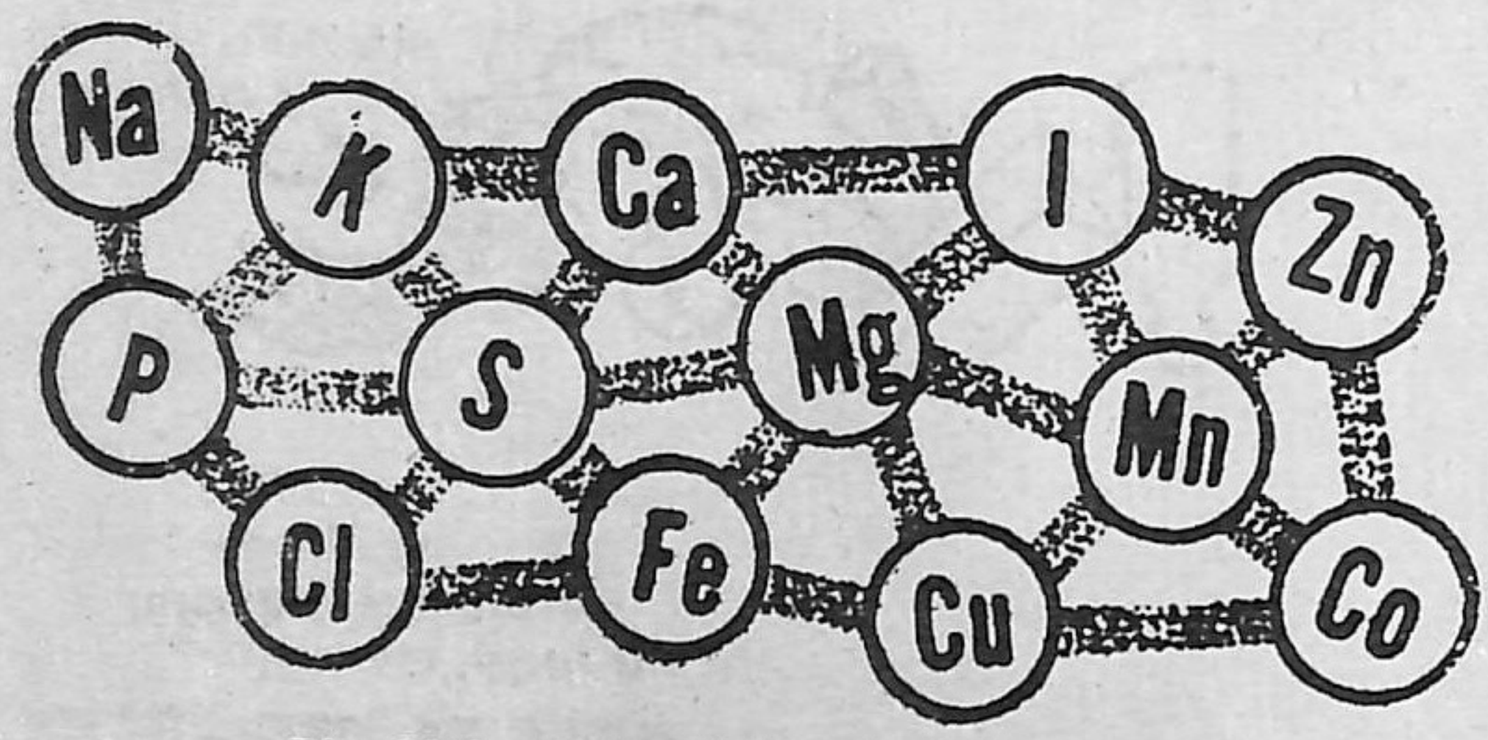


Fig. 10.5—Minerals Required for Health

	5. Iodine	Common Salt from sea-water, sea foods like crabs, oysters, prawns.	Required for the proper working of the thyroid gland.
	6. Sodium Chloride or Common Salt.	Sea Water, Rock.	1. Gives taste to food. 2. Required for the body tissues and blood. 3. Required for the Hydrochloric Acid in Gastric Juice.

Fig. 10.6—Foods rich in Iodine

	7. Copper	Egg, Liver, Dals, Green Leafy Vegetables.	1. Helps iron to form homoglobin in the blood. 2. Helps to form Melanin, the body pigment.
	8. Zinc	Green, Leafy Vegetables, Fruits.	1. Helps in hair growth. 2. Influences Carbohydrate Metabolism.

S.No.	Class of food	Element	Sources	Uses
		9. Cobalt (a small part of Vitamin B_{12})	Green, Leafy Vegetables, Liver.	1. Prevents acute anaemia.
		PROTECTIVE FOODS		
E.	Water	Two parts of Hydrogen and one part of Oxygen.	Rain, Lakes, River, Springs Wells and Tanks. Certain foods like green leafy vegetables, milk, water melon and cucumber contain a high percentage of water.	1. Required for all the body tissues. 2. Required for every chemical process. 3. Required for the digestive juices as a solvent. 4. It enters into the composition of the waste products of the body such as urine (Kidneys), sweat (Skin), faeces (Colon), water.vapour (Lungs) and so helps in excretion. 5. Prevents friction between moving body parts by acting as a lubricant. 6. Helps in the regulation of body temperature.
F.	*(a) Vitamins-Fat Soluble* Vitamin 'A' or Anti-Infective Vitamin.		Egg-Yolk, Fish, Liver oils, Liver, Milk, Cheese, Butter Cream, Spinach, Carrot, Tomato.	1. Keeps up general health of the body. 2. Gives good appetite and digestion. 3. Prevents infection against disease. 4. It is made by the liver from carotene (yellow substance of carrots and leafy vegetables) and stored in the liver. 5. Required for the eyes, throat and lungs.

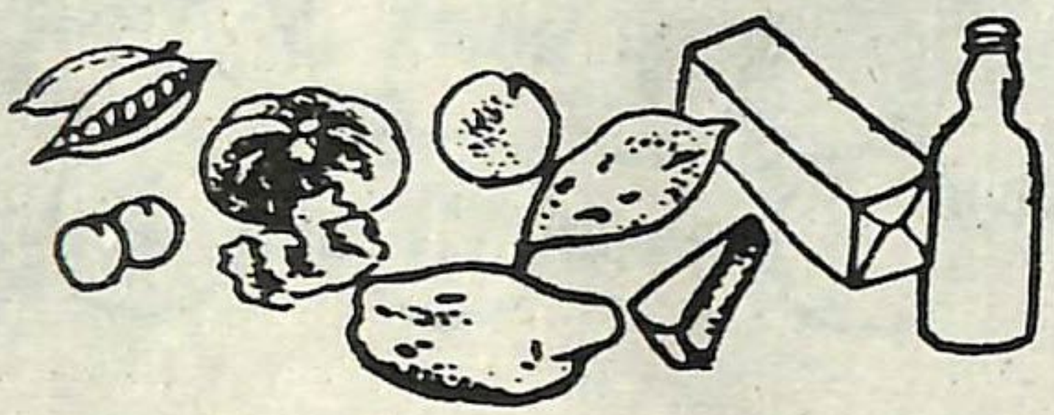


Fig. 10.7—Foods Rich in Vitamin A

S.No.	*Class of food*	*Elements*	*Sources*	*Uses*
E.	Vitamin 'D' or Anti-Rachitic Vitamin.		Egg-Yolk, Fish Liver Oils, Ghee, Butter, Sunlight.	1. Required for good bones and teeth. 2. Helps in the metabolism of calcium and phosphorus.
	Vitamin 'E' or Anti-Sterility Vitamin.		Unpolished Rice, Wheat, Green leafy vegetables, vegetable oils like coconut oil and mustard oil.	1. Required for reproduction.
	Vitamin 'K' or Meno-dione or the Coagulation Vitamin.		Wheat, Soyabean, Egg, Milk, Spinach, Cauliflower, Cabbage, Carrot-tops.	1. Necessary for normal coagulation of blood.
(b) Vitamins—Water Soluble				
	Vitamin 'B' Complex consists of the following :			
	Vitamin 'B_1' or Aneurin or Thiamine.		Egg-Yolk Yeast, Rice, Wheat, Green Vegetables, Fresh peas and bean, Germinating seeds.	1. Necessary for the nerves, appetite and digestion. 2. Helps to use up the carbohydrates stored in the body.
	Vitamin 'B_2' or Riboflavin.		Egg, Milk, Liver, Green Vegetables, Tomato, Apricot, Mango.	1. Required for normal fat metabolism. 2. Keeps the eyes, nose, mouth lips and tongue in a healthy state.
	Vitamine 'B_6' or Pyridoxine.		Liver, Egg-Yolk, Meat, Fish, Yeast, Rice, Wheat, Peas, Beans, Lentils.	1. Required to prevent inflammation of tongue and mouth. 2. Needed for the health of the skin. 3. Helps to bring about protein metabolism. 4. Necessary for the formation of haemoglobin.

Fig 10.8—Foods rich in Vitamin B

S.No.	Class of Food	Elements	Sources	Uses
	Vitamin 'B_{12}' or Cobione.		Liver.	Required for the haemoglobin of the blood.
	Vitamin 'PP' or Niacin or Nicotinic acid or Nicotinamide.		Yeast, Liver, Meat, Cereals.	Prevents a skin disease called Pellagra.
	Vitamin 'H' or Biotin.		Liver, Egg, Rice, Wheat, Yeast.	Required for a healthy skin.
	Vitamin 'H' or Folic Acid.		Egg, Liver, Yeast, Rice Wheat.	1. Required for the white blood corpuscles. 2. Necessary for the haemoglobin of the blood.
	Panthothenic Acid.		Egg, Liver, Milk, Whole Wheat, Unpolished Rice.	1. Required for growth and reproduction. 2. Keeps the digestive and nervous system in a healthy state.
	Vitamin 'C' or Ascorbic Acid.		Citrus fruits like orange, lime and lemon. Meat, milk, tomato, turnip, potato, green vegetables.	1. Necessary to keep the blood pure and in proper composition. 2. Helps the other vitamins to build the body. 3. Prevents a disease called scurvy.

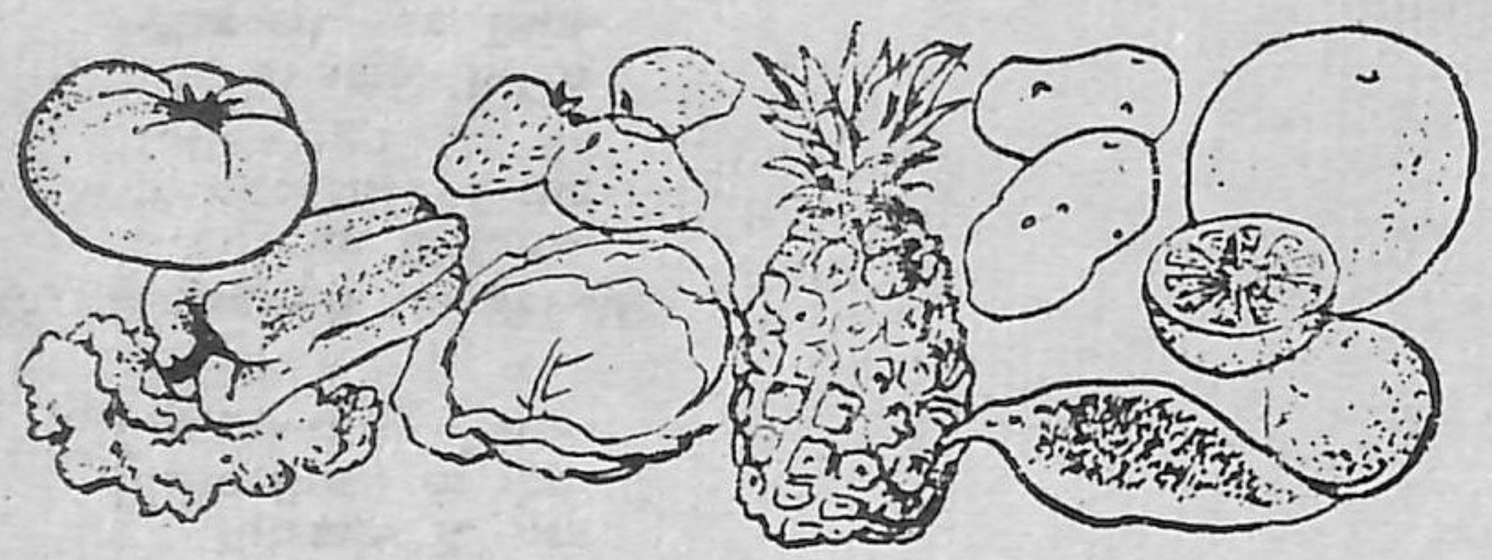


Fig. 10.9—Foods rich in Vitamin C

Summary

The food we eat, contains certain substances known as the Proximal Principles or *Nutrients*. The nutrients are classified according to their

(*a*) Chemical composition and (*b*) their function in the body. The nutrients needed by the body are carbohydrates, Fats, Proteins, Mineral Salts, Water and the Vitamins. These nutrients are received from the environment. Cereals, Potatoes, Sugar, Oils, Ghee and Butter are some of the examples of *Carbohydrates* and *Fats*. These furnish the body with materials needed for providing *heat* and *energy*. Milk, Meat, Egg, Fish, Legumes, Pulses, and Nuts are examples of the *Proteins* and *Mineral Salts* that are required for *building* and *repair* of body tissues and regulation of body processes. Water and Vitamins are found in the green leafy vegetables, fresh vegetables, fresh and dried fruits and the animal food stuffs. The vitamins are found in minute quantities in food stuffs but they are very essential. So they are known as the *Accessory* foods. They protect the body against diseases.

I. Essay Type and Short Answer Questions

1. In what ways do we benefit by eating :

   (*a*) Green vegetables and (*b*) fresh fruits ?

2. What are the important mineral salts contained in foods and what functions do they serve in our bodies ?

3. Name the nutrients in food. Mention those which are required for :

   (*a*) Producing heat and energy and

   (*b*) For building up the soft tissues.

Give examples of the foods in your ordinary daily diet which supply each need.

4. What is the importance of proteins in our food ? Mention four protein foods (as different as possible) which you take in your daily life.

5. How does the body obtain its supply of vitamins ? Describe the part played by any *two* individual vitamins in the maintenance of health ?

II. Objective Type Questions

(*a*) Fill in the blanks

1. Fats and carbohydrates contain the three elements....., ...and.....
2. The two most common carbohydrates are.....and.....
3. Carbohydrates and Fats burn in the body to release.....and.....
4. All proteins contain the element..... which is not present in Carbohydrates.
5. The white of egg is almost pure..... and the yolk contains mostly.....
6. .....among sailors was cured by .....because it contains.....
7. The water soluble vitamins are..... and .....
8. Three chemical elements often lacking in people's food are....., ...and .....
9. Animal proteins are called.....or complete proteins because they contain all the essential.....

(*b*) *True-False* : Mark (✓) for true statements. Mark (×) for false statements :

1. Proteins can be oxidised in the body to form energy.
2. Nicotinic acid and riboflavin are both vitamins of the 'B' group.
3. Ascorbic acid is the same as vitamin 'C'.
4. Eggs and milk contain complete proteins.
5. Red or yellow fruits contain vitamin 'A'.
6. The anti-beriberi vitamin is vitamin 'D'.
7. Water is not a food.
8. The carbon in fats can be oxidised in the body to carbon-dioxide.
9. Cooking water from green leafy vegetables should be thrown away.

(*c*) Write one word in the space provided to complete the second pair of related things (for example, hearing : ear, smelling : nose)

1. Proteins : Amino acids : Carbohydrates :.....
2. Phosphorus : bones and teeth : iron.....
3. Nicotinic acid : Pellagra : Calciferol :.....
4. Potatoes Carbohydrates : Lean Meat .....
5. Butter : Fats : Egg White : .....

(*d*) **Project—A Food Wheel**

6. Make a food wheel by drawing a circle with radius 15 cm.
7. Divide the circle into six equal parts.
8. Mark each type of nutrient in each and colour each part.
9. Collect pictures in different colours of different sources of food from newspapers, magazines, etc.
10. Stick these pictures against their relevant nutrients on the outside of each part in your food wheel.

CHAPTER 11

Nutrition—The Principal Food Stuffs

Good nutrition is vital to our physical and emotional well-being. It gives us vigour and stamina to carry on and to enjoy our daily activities. All the nutrients we require are found to be available in the ordinary or "everyday" food which we eat. These may be of animal or vegetable origin. However, in both cases their nutritive values should be considered. During the purchase of food stuffs their cost as well as the nutritive value should be taken into account.

Foods of equal cost may have a different nutritive value. Such foods of a wide variety enable one to have a healthy diet. These may be classified as follows :

I. Vegetable Foods

They contain a large proportion of carbohydrates and almost all the vitamins, proteins and fats. They are classified as : (1) Cereals, (2) Pulses, (3) Roots and Tubers, (4) Green vegetables, (5) Fruits, (6) Nuts, (7) Fungi.

The commonly used food stuffs have nutritive value as follows :

1. *Cereals.* These are in the form of grains and contain lots of nutritive material. The chief cereals are Rice. Wheat, Maize, Barley and Millets.

Food Values

Rice. It is rich in starch which is a very digestible form. It is poor in protein, fat and minerals. Therefore it is eaten with vegetables, dals, ghee, meat and fish to make up for this deficiency.

Wheat. It consists mainly of starch. It also contains some protein and fat and is rich in mineral matter. The chief protein of wheat known as *gluten* becomes sticky when heated gently and forms a dough. This dough is used for making bread, chappaties, puries, biscuits, cakes, etc. Wheat floor is sold as *atta*, *maida* and *sujee*.

Maize or Indian Corn. It consists of starch, protein, fats, salts and water. It is deficient in vitamins.

Millet. (*Bajra* or *Jowar*). It also contains starch, proteins and minerals but is less nutritious than wheat.

2. *Pulses* These include peas, beans and lentils, and are rich sources of protein called *Legumin*. They are deficient in fat. When fresh, they contain vitamin 'A', 'B', and 'C'. They lose 'C' vitamin when dried. They also contain sugar and minerals. Soyabean has a high percentage of protein, fat and minerals but almost complete

absence of starch. It has vitamin 'B' but no vitamin 'C' and 'D'.

3. *Root and Tubers.* They contain a high percentage of starch and proteins but fats are absent and mineral salts are present. Common examples are beetroot, carrot, radish, yam, arrowroot, tapioca and sweet potato.

4. *Green Vegetables.* These consist of leaves, buds, young shoots, leaf-stalks or the whole plant. They contain a high percentage of water, some protein, starch and fats. They also contain alkaline salts which keep blood in an alkaline state. They are rich in vitamins A, B, C, E and K.

5. *Fruits.* They are rich in sugar, acids, salts and vitamins. They add to the bulk of the contents in the intestine known as *Roughage* which prevents constipation.

6. *Nuts.* They have a high percentage of proteins and fats but contain less carbohydrates. They are better suited for diabetics, and are rich in vitamin 'B' but have very little vitamin 'A'. Vitamin 'C' is absent. They are not digested easily because they contain much cellulose.

7. *Fungi.* The edible fungi are the mushrooms. They contain over 90% of water and very little protein. They have no food value. They are very indigestible.

II. Animal Foods

These include (*a*) Meat, (*b*) Fish, (*c*) Egg, (*d*) Milk and its products.

(*a*) *Meat.* The carcase of an animal consists of three kinds of tissues, muscle, fat and bone. Meat usually means mutton, pork or beef. Good meat should be fresh with no smell. Bad meat is either too dark or too light in colour and soft in some parts due to excessive fluids. Lean meat contains about 60% water, 20% fat and 17% protein. Meat containing fat has about 40% water, 40% fat and only about, 12% of protein. Meat is rich in protein, iron and certain vitamins of B group especially Nicotinic Acid. Pork is a good source of thiamine. Liver, Kidney and Heart are good sources of riboflavine, thiamine, nicotinic acid and iron. Liver in addition has a high content of vitamin A. The flavour and aroma of meat is due to the presence of certain organic substances known as *Extractives.* They do not have much nutritive value but stimulate the appetite and increase the flow of the digestive juices.

(*b*) *Fish.* A great many kinds of fish, including shell-fish are used for human food. The flesh, like that of meat, consists mainly of protein, fat and water. The amount of fat varies greatly in different kinds of fish. Fish which contain a high fat content are known as the *oily* fish. Good example are mackeral, sardines, and herrings. The flesh of white fish like cod, sole has a very low fat content. As a source of minerals and vitamins, fish is equal to or better than meat. It is a good source of magnesium and phosphorus but contains less iron than lean meat and more iodine. Fish which has edible bones such as sardines, tinned salmon add calcium to

PERCENTAGE COMPOSITION OF MILK

Milk	Protein	Fat	Carbohydrate	Mineral Salts	Water
Human	1·5	3·0	6·5	0·2	88·3
Cow	3·5	4·0	4·5	0·7	87·3

the diet. Shell fish like crab, prawns, clams and mussels are like fish in composition, and are particularly rich in mineral elements. The frying and grilling of fish add greatly to its caloric value. Stale fish is soft, with sunken eyes and has a bad smell. Fish when kept at a normal temperature get stale because its flesh decays.

(*c*) *Eggs.* They have a high nutritive value. A hen's egg without the shell, consists of 74% of water, 13% of protein in the white and about 11% of fat present in the yolk. Eggs are rich in Iron, Phosphorus and certain Vitamins, including Vitamins A and D. The proteins present in the white of egg is known as *Albumin* and in egg yolk is called *Vitellin.* The proteins of egg have the highest biological value. Eggs form a valuable article, of diet, especially as the process of cooking has little effect on their nutritive value.

(*d*) *Milk.* Milk for human beings is obtained from a variety of animals like the cow, buffalo, goat and reindeer. All types of milk resemble one another in composition, but the constituents vary in proportion. Cow's milk is the one which is most commonly used Milk contains all the nutrients. It is generally given to babies and children for it is a complete food. Babies are usually given mother's milk upto six months and later cow's milk.

The proteins of milk are known as *Casein* and *Lactalbumin* and the sugar in milk is known as *Lactose.* The minerals present are Iron, Calcium Potassium, and Sodium. Milk is rich in vitamins A and B. It will be seen from the above table that the relative proportion of sugar and proteins in human and cow's milk are different and so it is necessary to modify cow's milk by diluting it and adding sugar before being given to infants as a food.

The Products of Milk

1. *Cream.* When milk is heated and then allowed to cool, a fair proportion of its volume rises to the top and this is the cream. Cream consists of a high fat content together with a small amount of the other nutrients or constituents. It is a rich source of energy.

2. *Toned or Skimmed Milk.* It is similar to whole milk in its contents of carbohydrate, protein, mineral and vitamins B and C, but lacks in fat and vitamins A and D, because they are removed with the cream.

3. *Butter.* It is nearly all fat and has vitamins A and D. It is made by

churning the cream which has been skimmed or separated from the milk.

4. *Yoghurt or Curd or Dahi.* Warm milk is separated into solid called *curd* by the addition of rennet or anything acid like a few drops of lime-juice or tamarind juice. The clear liquid which forms a part of curd is known as *whey*. The solid curd consists of protein, fat, sugar and minerals. Whey is water, milk-sugar and minerals.

5. *Cheese.* It is a valuable food. It contains about one-third of protein and one-third of fat together with calcium phosphorus and vitamin A. It has small quantities of vitamins B and D.

6. *Butter milk or separated milk.* It is similar to skimmed milk, being the residue left after the cream has been removed completely by intensive churning. It is less nutritious than skimmed milk because more fat has been removed.

7. *Ghee.* It is butter which has been strongly heated. This removes all traces of water and protein found in butter.

8. *Margarine.* It is made from edible fats, both vegetable and animal in order to enrich it in its nutritive value. 550 international units of vitamin A and 60 international units of vitamin D are added to each ounce during its manufacture.

9. *Vanaspati* or vegetable ghee is made from vegetable oils enriched like margarine with vitamins A and D for nutritive value.

Summary

The food eaten by us should be a mixture of both Animal and Vegetable food stuffs, but this depends upon one's choice. However the nutritive value and the cost of food should be taken into account during the purchase of food. Food is required by the body in order to provide heat and energy. Energy is the ability to do work.

The Vegetable foods as well as Animal foods contain a large proportion of all the nutrients in different ratios. The vegetable foods are classified under seven categories such as the Pulses, Root vegetables, Green Vegetables, Fruits. Nuts and the Fungi. Animal foods include Meat, Fish, Egg, Milk and its products. These are the principal faodstuffs eaten in our everyday life.

I. Essay-Type and Short Answer Questions

1. Give the food values of the following :—

   (*a*) Cereals (*b*) Pulses (*c*) Green Vegetables (*d*) Meat (*e*) Fish (*f*) Eggs.

2. Why is milk considered to be a perfect food ?

II. Objective Type Questions

(*a*) Fill in the blanks in the following :—

1. A vegetarian is also known as a .....and a non-vegetarian as a.....

2. Energy means the.....to perform some.....

3. Fruits add to the bulk of the contents in the intestine known as.....which prevents.....

4. Milk contains two proteins..... and.....

5. The flavour and.....of meat is due to organic substances known as.....

6. Fish contains the two vitamins .....and.....

(*b*) *True and False* : Mark True statements (✓) and False Statements (×) :

1. All foodstuffs have more or less the same nutritive value.
2. The pulses contain a protein called Legumin.
3. Lean meat is meat without its fat.
4. Milk is a perfect food for infants.
5. Whey is the clear liquid from curd.
6. Egg has two types of proteins.

(*c*) Select words from the following list which describe closely the words in Column A below and enter them in Column B :—

Vegetable, Ghee, Gluten, Cereal, Mineral, Fungus, Peas, Thiamine, Extractives, Fish Yoghurt.

Column A	*Column B*
Rice	
Sodium chloride	
Vanaspati	
Mushroom	
Wheat	
Vitamin	
Milk product	
Meat	
Mackeral	
Legume	

Things to do :

Make a graph to indicate the price index per kilogram of the following articles of food consumed in your daily diet :—

Bread, Rice, Wheat, Meat, Fish, Egg, Milk, Curd, Butter, Ghee, Cheese, Oil, Vanaspati, Sugar, Gur, Potato, Onion, Garlic, Ginger, Green Leafy Vegetables, Seasonal Vegetables, Seasonal Fruits.

CHAPTER 12

Diets and Deficiency Diseases

The term diet has been defined as the food eaten by a human being, or by a group of human beings considered as a whole. No one group of foodstuff alone is sufficient to sustain life ; hence a mixed diet consisting of the various nutrients is required. The most ready source of energy is through the carbohydrates and fats. Oxygen is required to convert this potential chemical energy of the food into heat and work. However, the body temperature is kept at a constant level, and any excess of heat is disposed of by the heat-regulating mechanism of the body mainly through the skin.

Energy is the capacity to do work. It occurs in many forms such as heat, electricity, light or mechanical energy. It can never be destroyed but one form of energy may be converted into another, for example, the energy of a waterfall may be converted into a current of electricity which may appear as light or heat or used to drive a machine. Thus the body needs energy for its various organs to perform their functions. How is this energy got ? It is obtained from the oxidation of Carbohydrates, Fats and Proteins in the diet. Since one form of energy is converted into another without any loss or gain, so it does not matter in what form this energy is measured. Heat units have been chosen because these are most convenient.

The unit of heat is known as the *Calorie* which is the amount of heat required to raise the temperature of one gram of water through 1° centigrade. In nutrition the unit used is the kilogram calorie, or the large *Calorie*. It is equal to 1000 small calories. The caloric values of different types of food vary. The amount of heat produced by the oxidation of carbohydrates, fats and proteins is as follows :

1 gram carbohydrate	supplies	4·1 C.
1 gram Fat	,,	9·3 C.
1 gram Protein	,,	4·1 C.

Thus a diet which consists of 50 grams of protein, 50 grams of fat, 500 grams of carbohydrates would produce about 2,650 calories in the body.

The energy requirements of the body depend upon the type of work done and the heat lost by the body. A man lying at rest in a warm room requires a minimum of 1700 calories

per day and a woman at rest requires about 1450 calories per day. This is known as the *Basal metabolic rate or* B. M. R.

Balanced Diets

A balanced diet is one which contains all the nutrients required. The body makes a better use of nutrients when a variety of foods is eaten. The choice of foods from each of the groups mentioned below will provide the necessary ingredients for a balanced diet.

For Energy

Cereals, potatoes, sugar, gur, sweets, oils, ghee and butter.

For Growth and Body Building

Milk, pulses, legumes, wheat, eggs, fish and nuts.

For Protection

Green leafy vegetables, other fresh vegetables, fruits (fresh and dried).

It must be mentioned that most foods include some nutrients from more than one group. Hence a diet should consist of a large variety of foods since no one food alone is enough to maintain life for any length of time.

The caloric value of food is also destroyed during its preparation by some. Therefore food should be cooked in small amounts of water, which should not be thrown away but used for soups or other suitable dishes. Fresh fruits and vegetables form an important part of the diet and should be eaten raw rather cooked. The practice of cutting vegetables into small pieces and boiling them for a long time should not be encouraged.

The number of calories required depends on age, sex, occupation, pregnancy, lactation and climate.

1. *Age.* During the first year of life highest number of calories are used per pound of body weight because the growing process is rapid. Then the number of calories required per pound decreases. When *puberty* occurs energy-giving and body building foods are required so the number of calories required increases again. In the *adult* the number of calories required remains constant at about one calorie per hour for every kilogram of body weight. The caloric requirement decreases again in *old age.*

2. *Sex.* Women are said to need one-tenth less food than men probably due to lighter work done by them.

3. *Occupation.* People who do hard, manual work require more calories and particularly the heat producing foods. In the case of people who are idle or at rest less food should be eaten. Brain workers particularly require well cooked and easily digestible food.

4. *Climate.* In winter more calories in the form of fat are used up in order to keep up the body temperature.

Diets for Pregnancy, Lactation and Adolescence

Investigations of the diets of

Pregnant women show that an adequate diet is of great importance for normal pregnancy and child birth. A poor diet causes problems. Increased intake of calcium, Iron and Vitamin C is required, especially during the latter half of pregnancy. In winter minimum vitamin D is required because of the lack of proper sunlight. Energy-giving food requirement depends upon an individual basis and varies from person to person. Weight should be recorded regularly. It is important to avoid overweight. The quantity of milk taken should be increased during the final six months to at least 500 millilitres daily. At least one egg and one item of citrus fruit should be taken daily and liver should be included in the menu once a week. Women who are well-developed physically and enjoy good health have an easy child birth than those who are poorly developed and sick. It should be noted that a satisfactory diet during infancy, childhood and adolescence plays an important role towards sound health during adult life.

In the case of the *Lactating* mother or one who is breast feeding her baby, the same diet as in pregnancy should be continued with a further increase in the quantity of milk. Lots of fluid intake is required. Instead of milk, cheese, butter, curds may be taken.

During *Childhood* and *Adolescence*, the diet is similar to that of adult life. It is important that the large appetites of young people are satisfied with large and well-balanced meals. Milk should be taken daily. A large amount of iron in the form of meat and eggs, green leafy vegetables, salads, apples, and peas should be taken. Thus young people who have learnt the value of good diets at home will choose suitable foods for themselves in school, college or work canteens and so in their turn pass on good habits to the next generation.

BALANCED DIET

Grams per day

S. No.	Type	Cereals	Pulses, nuts and oil seeds	Green leafy vegetables	Roots & tubers	Other vegetables	Fruits	Sugar & Jaggery	Oil and fats @	Milk	Meat and Fish	Egg No.
1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Adult (moderately active) Vegetarian	400	114	114	85	85	85	57	57	284	—	—
	Non-Vegetarian	400	114	114	85	85	85	57	57	284	85	1
2.	Expectant mother Vegetarian	343	85	85	57	85	85	43	43	457	—	—
	Non-Vegetarian	342	57	85	57	85	85	43	43	342	85*	1**
3.	Nursing mother Vegetarian	315	85	85	57	85	85	43	43	914	—	—
	Non-Vegetarian	315	57	85	57	85	85	43	43	684	85*	1**
4.	Industrial or Agricultural Worker Vegetarian	457	143	85	114	85	—	57	57	284	—	—
	Non-Vegetarian	457	114	85	114	85	—	57	57	284	85	—
5.	School child (6 to 11 years) Vegetarian	228	71	57	43	43	43	43	28	457	—	—
	Non-Vegetarian	228	57	57	43	43	43	43	28	342	57*	1
6.	Adolescent (12 years and above) Vegetarian	342	100	114	85	85	43	43	43	457	—	—
	Non-Vegetarian	342	85	114	85	85	43	43	43	342	57	1

* Based on the data given in 'The Nuritive Value of India Foods and the Planning of Satisfactory Diets' (Special Report Series No. 42) produced by the Indian Council of Medical Research, New Delhi.

@ Includes butter and ghee.

* Four times a week.

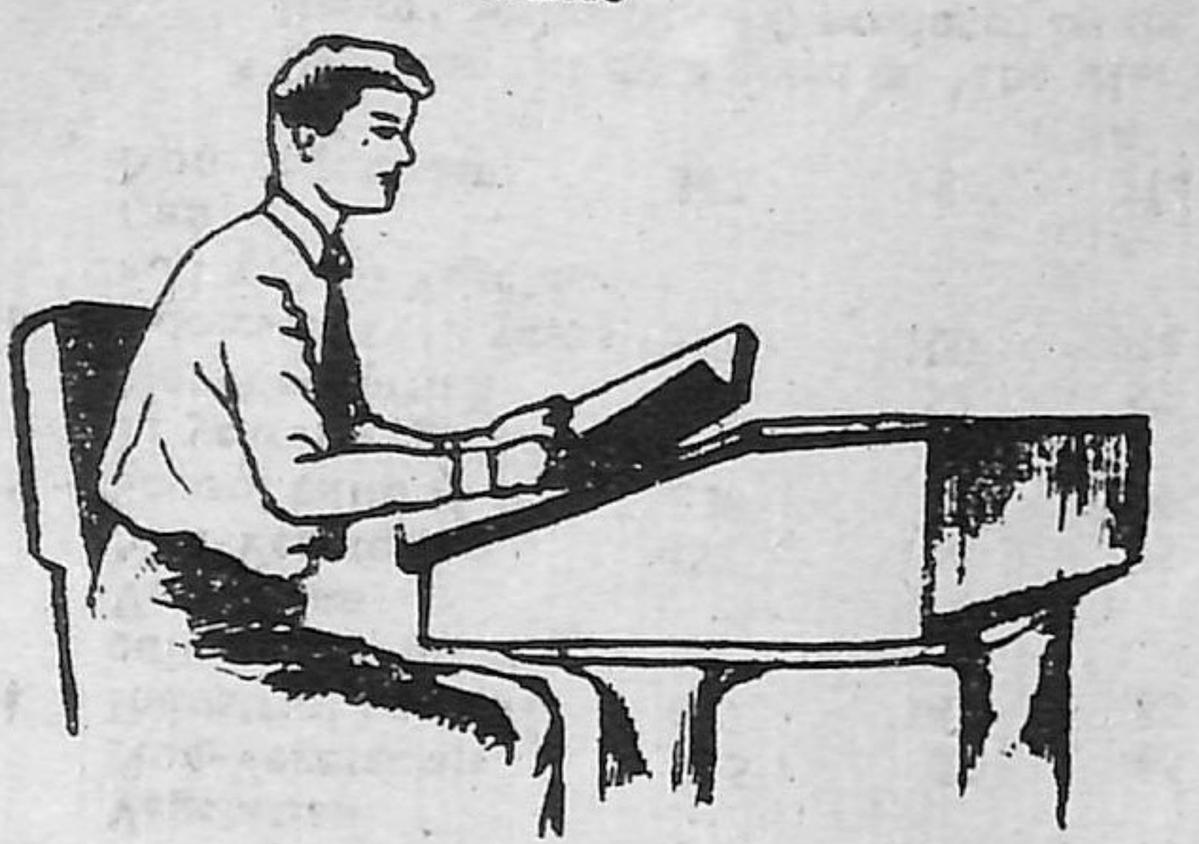
** Three times a week.

*** Based on compositions from special Report Series No. 42 of Indian Council of Medical Research, New Delhi, and 'Road to Good Nutrition' by Dr. M.V. Radhakrishna Rao, Published by the Department of Nutrition, Government of Maharashtra, Bombay.

DIETS AND DEFICIENCY DISEASES

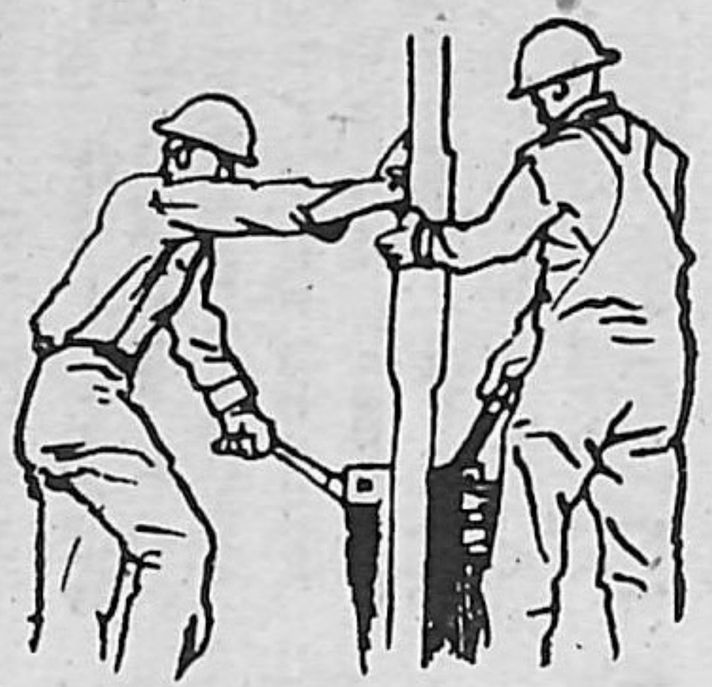
Calorie Pictures

1. Men Workers



A Sedentary Worker

A Moderate Worker



Heavy Worker

2. Women Workers

A Sedentary Worker

A Moderate Worker

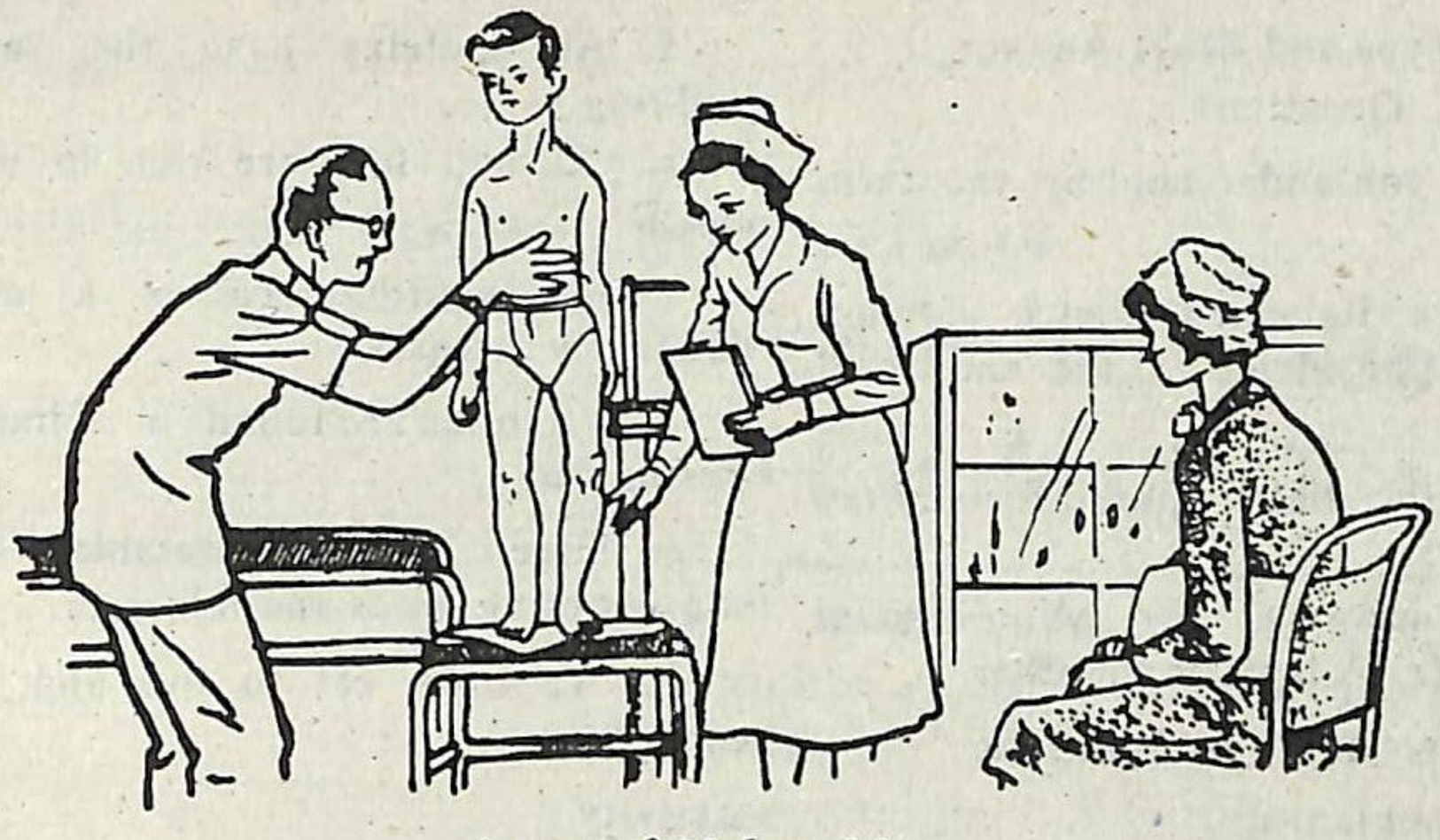
RECOMMENDED DAILY ALLOWANCES OF CALORIES AND SOME ESSENTIAL NUTRIENTS*

	Net Calories	*Proteins* g	*Calcium* g	*Iron* mg	*Vitamin A* I.U.	*Thiamine Vitamin B* mg	*Ascorbic acid Vitamin C* mg	*Vitamin D* I.U	*Others*
Men—									
Sedentary work	2400	55	1·0						
Moderate work	2800								
Heavy work	3900								
Women—									
Sedentary work	2000	45		20 to 30	3000 to 4000	1·0 to 2·0	50	400 to 800	Please see note below
Moderate work	2300								
Heavy work	3000								
Pregnancy (later half)	2300	100							
Lactation	2700	110	2·0						
Children—									
5 to 6 years	1600	3·0 per kg. of body weight							
6 to 7 years	1800								
7 to 9 years	1800								
10 to 12 years	2100								
Adolescents—				1·0 to 1·5	10 to 30	3000 to 4000	0·5 to 1·0	30 to 50	400 to 800
13 to 15 years									
Girls	2100	2·5 per kg. of body weight							
Boys	2500								
16 to 19 years									
Girls	2100	2·0 per kg. of body weight							
Boys	3150								

Note : Carbohydrate requirements will be met if the constituents given above are obtained from a variety of natural foodstuffs. As regards fat an amount which contributes not more than 15% of the calories (approximately 14 to 16 grams according to age) in the diet is desirable. The exact requirement of riboflavin has not been determined yet. However, requirements vary from above 0·4 *mg* for infants to about 2·5 *mg* for adolescents and nursing women with an average of about 1·5 *mg* for normal adults. Requirements for nicotinic acid range from about 4 *mg* to 19 *mg* depending on the age and physiological needs of the individual.

FOOD DEFICIENCY DISEASES

S.No.	Name of Deficiency disease	Cause of the disease	Signs and symptoms
1.	Kwashiorkor	Insufficient Protein	Swelling, stunted growth, Muscle, wastage, Anaemia, Pigmentation.
2.	Famine Oedema	Insufficent Protein	Weakness, Wasting of body tissues, Loss of weight.
3.	Rickets (children)	Insufficient Calcium and Phosphorus	Deformed bones.
4.	Osteomalachia (adults)	do	Softening of bones
5.	Haemorrhage	do	Excessive bleeding
6.	Caries	do	Decay of teeth
7.	Anaemia	Insufficient Iron	Weakness, Paleness and tiredness
8.	Goitre	Insufficient Iodine	Swelling in the neck due to enlargement of the thyroid gland.
9.	Muscle Cramps	Insufficiency of sodium chloride or common salt	Excessive tiredness.
10.	Dehydration of tissnes	Insufficiency of water	Loss of weight, weakness
11.	Malnutrition	Insufficiency of calories	Tiredness, skin troubles, pigmentation, deformed bones, pot belly, poor posture, anaemia. loss of weight.
	Vitamin Deficiency Diseases—Fat Soluble Vitamins		
12.	Night Blindness	Deficiency of Vitamin A	Loss of ability by the eyes to see in dim light.
13.	Xetopthalmia	do	Drying of the cornea which may lead to total blindness.
14.	Rickets (children)	Deficiency of Vitamin D	As for Calcium and Phosphorus
15.	Osteomalachia	do	do
16.	Caries	do	do
17.	Sterility	Deficiency of Vitamin E	The inability to bear offspring
18.	Haemorrhage	Deficiency of Vitamin K	Excessive bleeding
	Vitamin Deficiency Diseases—Water soluble Vitamins		
19.	Beri-Beri	Deficiency of Vitamin B	Nerves affected, Pain in legs and feet, weakness, wastage of muscles, Heart weakened.
20.	Pernicious Anaemia	Deficiency of Vitamin B 12	Loss of Red blood corpuscles causes a pale skin, general weakness.
21.	Pellagra	Deficiency of Niacin or Nicotinic acid	Skin becomes rough and scally, soreness of mouth, redness of tongue and digestive upsets.
22.	Anaemia	Deficiency of Folic Acid	Paleness of skin, general weakness.
23.	Scurvy	Deficiency of Vitamin C	Pain in joints and limbs; haemorrhage swollen gums and Anaemia.



A case of Malnutrition

The Deficiency Diseases

One of the major problems in the world today is to provide sufficient food for the rapidly increasing number of people in it. It has been extremely difficult in the under-developed countries for food production to keep pace with an expanding population. In these countries many of the people do not get sufficient calories in their daily diet to provide the energy required for doing work and to maintain health. Quite apart from a lack of proper nutrition, local customs also affect nutrition; for instance infants in some places are fed mainly on a starchy diet and proteins though available are not taken. In highly industrialised countries many elderly people living alone neglect the preparation of food. In such cases due to this under nourishment, *Malnutrition* occurs. In severe cases this may even cause death due to various forms of deficiency. Various deficiency diseases, their causes and symptoms are given on page 80 in the form of a table.

Summary

The food eaten provides the body with Energy. Energy is the capacity to do work. Energy is in different forms, which can be interchanged. It is measured by the heat unit known as a *calorie*. The amount of calories produced by the oxidation of the carbohydrates, fats and proteins is taken as the standard and on it depends the choice of menu planning for all forms of activity. A *Balanced diet* is one which consists of all the nutrients combined together in the right proportion. The unit of heat is known as the Calorie. In nutrition the unit known as the Kilo-Calorie is taken as the basis for finding the Caloric value of food stuffs. The number of calories one requires depends upon age, sex, occupation, pregnancy, lactation and climate. Special emphasis should be placed in the planning of diets for adolescents, pregnant women and lactating mothers. A deficiency of the various nutrients causes various types of deficiency diseases and malnutrition.

I. Essay Type and Short Answer Questions

1. What do you understand by the term "Energy."

2. What is a Balanced Diet? Explain the factors to be considered in the choice of calories.

3. Mention the diets required for any *two* of the following :

(*a*) An adolescent, (*b*) A pregnant woman, (*c*) A lactating mother.

II. Objective Type Questions

(*a*) Fill in the blanks :

1. .....is the term used for the food eaten by a human being.

2. A.....diet consisting of the various nutrients is the best form of diet.

3. A.....is the unit of heat.

4. One gram of fat supplies.....

5. The minimum number of calories required by a person at rest is the.....

6. Boiling.....for a long time should not be encouraged.

(*b*) *True/False.* Mark true statements with a (√) and mark false statements with a cross (×).

1. All proteins have the same body-building value.

2. Oils and fats are rich in vitamins A and D.

3. Malnutrition causes a number of deficiency diseases.

4. Vitamins are found in minute quantities in food.

5. Green leafy vegetables are rich sources of vitamins and minerals.

6. We must eat to live and not live to eat.

Activity

1. Make the following posters :

(*a*) "Meals on Wheels" to solve the problem of Malnutrition.

(*b*) "A time for meals" to inculcate regularity in the eating of meals.

2. Complete the table by filling in the names of :

(*a*) *One* disease caused by the deficiency of each of the vitamins.

(*b*) A food which contains large quantities of this vitamin.

(*c*) Whether the vitamin is soluble in fat (or oil) or water.

Vitamin	(*a*) Deficiency disease	(*a*) Best source	(*c*) Solubility
A			
B			
C			
D			
K			

"Prevention is beter than Cure."
—A Proverb

Communicable and Non-Communicable Diseases

Chapter 13—*Health and Disease—Kinds of Diseases.*

Chapter 14—*Body defences, Immunity, Natural and Acquired.*

Chapter 15—*Health Morbidity and Mortality in India, National Health Programmes.*

CHAPTER 13

Health and Diseases —Kinds of Diseases

The environment in which man lives has a profound influence on him inspite of his manifold scientific achievements. All living organisms including man live in a highly competitive world where struggle for survival is acute. Man's internal environment, therefore, is constantly under the influence of the external forces of nature. The relationship of man with the harmful agents and external environment can be shown by a triangle as given in Fig. 13.1 on the next page.

In the struggle for survival whenever a man is in a perfect balance with the environment and has an upper hand over the harmful factors like disease bacteria, insects, physical and chemical agents etc., he is said to be healthy. Under these conditions there is a normal functioning of his body and mind and he can carry out his personal and social duties efficiently. One can be considered to be in a state of positive health when all the organs in the body are functioning at the best physiological level and the body as a whole has attained its full biological potential and balance in the total environment.

Disease is a departure from a state

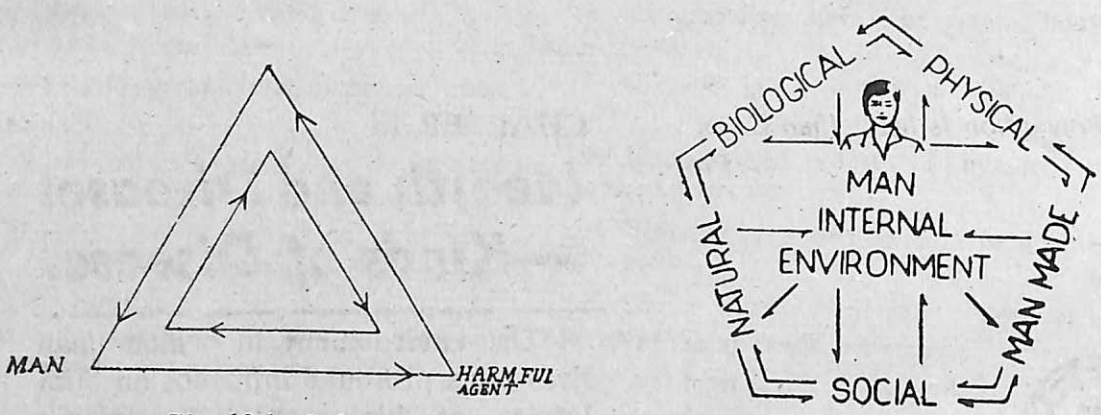


Fig. 13.1—Relationship triad of man, environment and harmful agents

of health. Disease has been defined as a state which limits life in its power, duration or enjoyment. Whenever an individual is out of balance with nature and his environment, he is ill and unhappy.

The word disease, literally means lack of ease or comfort, thus emphasizing the fact that health is a state of well being or a feelir of complete harmony with the environment. The mechanisms responsible for the internal adjustment of the body to cope with the essentially hostile external forces are usually able to do their job successfully and maintain the body in a state of health. But under certain conditions like extremes of temperature, lack of proper nourishment, severe attack by parasitic organisms, degeneration of organs or aging, the balance is upset and a person falls sick. Under these circumstances disease could be considered as a partial or total failure of the internal adjustment (Homeostasis) mechanism in maintaining conditions necessary for health.

Kinds of Diseases

On the basis of the cause that

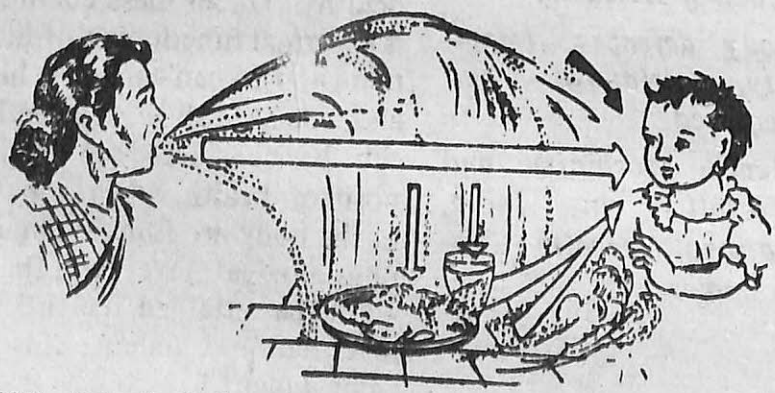


Fig. 13.2—Spread of tuberculosis and other air-borne diseases Infection by cough spray through air contaminated from dust or through direct contact.

disturbs the natural balance of the body, diseases can be classified as under :

1. Infectious diseases or Infective disorders. In these cases the cause of the disease is invasion of the body tissues by living parasitic organism like protozoa, bacteria, viruses, worms or fungi. These organisms cause damage to the host tissues in various ways.

Examples of infective diseases are tuberculosis, pneumonia, typhoid, cholera, dysentery, malaria, smallpox, infective hepatitis, etc.

2. Diseases due to physical and chemical agents such as burns and poisons. It is not only the biological agents (the parasitic organisms) that produce disease ; physical and chemical agents like heat, cold, X-rays, high altitude, various chemicals and poisons can also produce marked abnormal changes in the body and thus cause disease.

3. Diseases due to injuries. Accidents are very common in our daily lives and result in cuts, wounds stabs, fractures, head injuries etc. All these also affect the body adversely. Fortunately the body has a good healing power and most of these injuries mend fairly fast.

4. Diseases due to nutritional deficiencies. Deficiency of essential food substances (nutrients) is found to result in a number of diseases. Thus deficiency of protiens can lead to liver disease and Kwashiorkor, deficiency of iron to anaemia ; deficiency of vitamin A to night blindness, deficiency of vitamin B to pellagra and beri beri ; deficiency of vitamin C to scurvy and deficiency of vitamin D to rickets.

Fortunately deficiency diseases are fully curable, particularly if detected in the early stages. The deficient nutrient can be supplied to the body through diet, tablets and capsules or injections.

5. Diseases of degenerative origin like thickening of the arteries, cirrhosis of the liver, etc.

These diseases are due to qualitative and quantitative changes in the various metabolic processes of the body. Many of them occur in old age.

The progress of these diseases can be checked by suitable treatment.

6. Diseases due to new growth like tumours and cancer. These diseases are due to unchecked or uncontrolled division and growth of certain cells in the body. The result is a swelling or growth which presses on the structures in that region and leads to pain and other types of discomfort.

A lot of research is being done in this field and fortunately all outgrowth are not cancerous. Even cancer can be cured if detected in early stages.

7. Miscellaneous diseases like diseases of allergic origin. Our body has been found to be sensitive to certain foreign substances, particularly those being made up of proteins. On coming into contact with these proteins, the body produces antibodies and a reaction occurs. This may be in the form of a rash, asthma, rheumatic fever, etc.

Fig. 13.3—Methods of the spread of diseases

Fig. 13.4—Measures for the protection against fly nuisance

The body may be allergic to certain chemicals or drugs also. Other things that cause allergies are pollen, dust, nylon and other synthetic fabrics etc. Some allergic reactions can be very severe so it is best to avoid contact with substances to which one is allergic.

8. Hereditary diseases like colour blindness, haemophilia, diabetes, insanity, etc.

These are mostly due to defective genes and are passed on from one generation to the subsequent ones.

They cannot be cured.

Communicable and Non-Communicable Diseases

Communicable diseases are diseases which under certain conditions tend to spread among individuals in a community. They are infectious diseases that can be transmitted from one individual to another or from animals to man. Most of the infectious diseases are due to the invasion of the body by specific micro-organisms, producing characteristic symptoms.

The infectious diseases spread through :

1. Air. During coughing, sneezing, speaking loudly, etc., droplets of sputum are sprayed into the air in minute particles which contain germs of infectious diseases. The air of crowded places, ill-ventilated rooms, school rooms, cinema houses, etc., is often full of different kinds of bacteria when they are inhaled by a healthy person, the infection is conveyed to him. Examples are diphtheria, whooping cough, measels, influenza, common cold, pulmonary tuberculosis, etc.

The only air-borne diseases are smallpox and measels.

2. Food and Water. Certain diseases are spread through infected articles of food and drink. Flies may sit on exposed food and deposit disease bacteria. Diseases of the digestive tract like cholera, typhoid, dysentery, diarrhoea, gastro-enteritis, etc., are spread in this way.

3. Insect bites. Certain insects are vectors of diseases and transmit infection through bites on the skin as in malaria, yellow fever, dengue, filariasis, plague, sleeping sickness, etc.

Safe water *Protected food* *Control of flies* *Clean hands* *Immunization*

Fig. 13.5—Personal preventive measures

4. **Cuts in the skin.** The infection of anthrax, tetanus, rabies, syphilis, gonorrhoea, etc., enters through breaks in the skin.

Non-Communicable diseases are those that are not transmitted from one person to another.

Control of Communicable Diseases

It is very important to check the spread of communicable diseases otherwise they would fast assume epidemic proportions and take a heavy toll of life. The general methods of control are :

1. **Notification.** The local health authortiy should be immediately informed of the occurence of any case of communicable disease so that immediate steps may be taken to check the spread of the disease in the community. Because of their serious nature, the following diseases should be specifically notified : Smallpox, cholera, plague and poliomyelitis.

2. **Isolation.** Infectious diseases spread from the patient to healthy people who come into contact with him. So it is best to isolate the patient in a room, away from other members of the family. Only the person who attends on the patient should go into the room. Or the patient should be shifted to the isolation ward of a hospital. In this way spread of the disease would be checked.

3. **Disinfection** of all articles used by the patient—his bedding, clothing, utensils and fumigation of his room are all very necessary once he has recovered. They may otherwise pass on the infection to other members of the family who use them afterwards.

4. **Immunization** is a very important method to control the spread of infectious diseases. All members of the patient's family should take the preventive inoculation. Also children should be protected against T.B., cholera, typhoid, diphtheria, whooping cough, polio and smallpox, as per the schedule given in the next chapter.

5. **Personal Cleanliness** is the next most important method of prevention and control of disease. It

consists of the following :

(*i*) Bathing and washing.

(*ii*) Washing hands with soap and water after toilet and before eating,

(*iii*) Keeping combs, hairbrushes, towels, handkerchiefs and all household utensils, cutlery, etc., clean.

(*iv*) Using a handkerchief while coughing, sneezing, etc., to avoid passing on the spray to others.

(*v*) Washing hands thoroughly with an antiseptic after handling a patient.

(*vi*) Great care about the cleanliness of food and drink and not eating articles of food exposed to dust and flies.

The above five methods *viz.*, notification, isolation, disinfection, immunization and personal cleanliness represent the care of the prevention of disease in the community.

Summary

Man's internal environment is constantly under the influence of the external forces of nature. In this struggle for survival, whenever man is in a perfect balance with the environment and has an upper hand over its ha nful factors, he is said to be healthy. Disease is a departure from a state of health. It can also be considered to be a partial or total failure of the internal adjustment, (homeostasis) mechanism in maintaining conditions necessary for health. Diseases can be classified on the basis of the cause that disturbs the natural balance of the cause. Communicable diseases are infectious diseases that can be transmitted from one individual to another or from animals to man. Non-communicable diseases are not transmitted from one person to another. Infectious diseases spread through air, water and food, insect bites or through contaminated articles, cuts in the skin, etc.

Notification, isolation, disinfection, immunization and personal cleanliness represent the core of the prevention of disease in the community.

I. Essay Type and Short Answer Questions

1. List the different kinds of diseases and give two examples of each.
2. What is the difference between communicable and non-communicable diseases ? How do infectious diseases spread ?
3. What measures can we take to control the incidence of communicable diseases in the community ?

II. Objective Type Questions

(*a*) Fill in the blanks :

1. A man is in a prefect.....with the environment in the struggle for.....

2. Positive health is when the organs are functioning at the best.....level and the body attained its full biological.....

3. The word disease means lack of .....or.....

4. A partial or total failure of internal adjustment or.....mechanism causes a.....

5. Infectious or.....diseases are caused by.....organisms.

6. An allergy in sensitivity to certain .....substances particularly those being made up of.....

(*b*) *True and False* : Mark (√) for true

statements and (×) for false statements in the following :

1. Communicable diseases are transmitted from animals to man.

2. Droplet infection in the air spreads diseases through coughing, sneezing and speaking.

3. A disinfectant is a substance used to destroy micro-organisms.

4. An antiseptic prevents the growth of micro-organisms.

5. Immunisation does not control the spread of diseases.

6. The slogan should be "Kill the fly".

Activities

1. Make a list of the things you can do, as an individual, to prevent the spread of diseases in the community.

□

CHAPTER 14

Body Defences, Immunity : Natural and Acquired

The human body is very well adapted to deal effectively with various kinds of harmful organisms that surround it. It has a number of barriers that exist at various levels to combat disease-producing microbes.

The First Line of Defence

The skin protects our body against the invading bacteria from the outside atmosphere. A number of glands pour their secretions on the surface of the skin. These secretions contain substances like *lysozyme* which actually kill bacteria if brought in actual contact with them. Secretions of the eye also contain lysozyme.

Similarly, the systems of the body like the respiratory and digestive, are lined internally by a protective layer of mucous membrane. This secretes a slimy fluid called *mucous* which contains an enzyme that destroys bacteria. Further, the cells of the mucous membrane of the respiratory tract have hair-like projections called cilia. If dust particles or other foreign bodies enter the respiratory passages, the *cilia* force them out by causing one to sneeze or cough.

Tears in our eyes destroy and wash away micro-organisms. The *acid* in our stomach also kills certain germs like the bacteria causing cholera and typhoid.

All these methods constitute the first line of defence.

The Second Line of Defence

If, however, micro-organisms do succeed in entering into the body they may travel upwards through the lymphatics and may get trapped into the lymph nodes or lymph glands. The *lymph nodes* are present in large numbers throughout the body and act as filtering stations where the entrapped microbes are destroyed.

Once bacteria enter the body an '*inflammatory reaction*' is set up to combat them. The blood vessels dilate and bring more blood to the affected part. The white blood corpuscles then come out from the blood capillaries and surround the bacteria and eat

them up. The white blood corpuscles are therefore, rightly called the soldiers of the body. They, along with the dead bacteria can accumulate in the wound as pus.

The rest of the body responds to the inflammatory reaction by going in a state of emergency and providing more white blood corpuscles and fever.

These constitute the second line of defence.

The Third Line of Defence

Our blood also produces substances called *antibodies* to fight the invading micro-organisms.

Antibodies are complex proteins and a specific antibody is produced against a specific microbe. Antibodies are of several kinds :

(*i*) *Antitoxins*. These neutralize the specific toxins released by the microbes, *e.g.*, tetanus antitoxin, diptheria antitoxin.

(*ii*) *Bacteriolysins* which bring about dissolution of specific bacteria.

(*iii*) *Agglutinins* which cause clumping of the invading microbes.

(*iv*) *Opsonins* which prepare bacteria to be easily engulfed by the white blood corpuscles.

The antibodies produced by the body against specific bacteria persist in the blood for a few months to many years, and so serve to protect the body against a subsequent attack by the same bacteria. This is called *acquired immunity*.

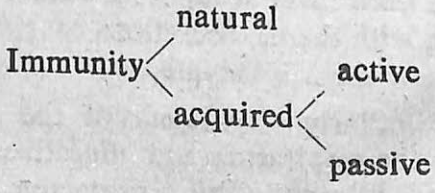
In addition to the above defence mechanisms the body has some other helpful protective devices. These include *sensations* like pain or sight, *compensatory mechanisms* and the enormous *functional reserve* of the organs, *clotting* of blood, etc.

The sensation of pain gives a signal of disease and also makes one attend to it urgently. If a kidney, lung or any other organ is damaged the remaining organ or its part takes over the function to keep things going. The capacity of the blood to clot prevents undue loss of blood from the body.

People who have good habits of personal hygiene give further protection to their body against disease.

Immunity

The power of resistance of the body to disease is called *immunity*.



Natural Immunity. It is the resistance offered by the body under the normal conditions without any external stimulation of previous infection. It is either possessed from birth or aequired during growth. It may be :

(*i*) *Species Immunity*, *e.g.*, hens are immune against tetanus,

dogs, rats and mice are immune against tuberculosis.

(*ii*) *Racial Immunity*, *e.g.*, negroes are immune against yellow fever.

(*iii*) *Individual Immunity*.

Acquired Immunity. Immunity may be acquired in two ways, *i.e.*, actively or passively.

(*a*) **Active**. In this case antibodies are formed by an individual's own tissues as a reaction to an antigen. The body cells are actively stimulated to produce antibodies by natural or artificial means, *i.e.*, in some diseases like smallpox, an attack confers a certain amount of immunity against a second attack (natural acquired immunity) or antibodies are produced as a result of inoculation with germs or their products (active acquired immunity).

Immunization against 1	*Immunizing agent* 2	*When to give* 3	*Method and dose* 4	*Effectiveness* 5
1. Smallpox	Dried vaccine	2-3 months	(*a*) Scratch (*b*) Rotating lancet	3 to 5 years.
2. Diphtheria	Toxoid	3-5 months	3 doses at one months' interval	Booster at 5 and 10 years.
3. Pertussis	Pertussis vaccine	3 months	3 doses at monthly interval	Booster not required
4. Tetanus	Toxoid	Any time. If combined at 3rd month.	2 doses at monthly interval	When injury accurs, booster dose.
5. Polomyelitis	(*i*) Salk vaccine	Six months to one year.	3 injections at monthly interval.	Booster after six months of 1st dose
	(*ii*) Sabin oral polyvalent vaccine	3rd month onwards	By mouth, two doses at monthly interval 3 doses for infants	No booster required.
6. Tuberculosis	B.C.G. vaccine	At birth or early childhood	Intra-dermal, preferably in the left arm	Not fixed. Booster if tuberculin test is negative.
7. Cholera	Cholera vaccine	One year	2 doses at monthly interval	6 months
8. Plague	Plague vaceine	One year	2 doses at monthly interval	1 to 2 years
9. Typhoid	T.A.B. vaccine	One year	2 doses at monthly interval	1 year.
10. Yellow fever	Special vaccine	International travel	1 c.c. to all ages	6 years.
11. Typhus	Virus vaccines	1 year	Adults, 1 c.c. Children proportionate 2 doses at monthly interval	1 year.

(*b*) **Passive.** This kind of immunity is aquired by the introduction (into the body) of antibodies produced in some other immune person or an animal of the same or another species.

It may take place in three ways :

(*i*) A mother supplies immune bodies to her foetus.

(*ii*) The inoculation of immune blood or serum from convalescents.

(*iii*) The inoculation of serum from animals artificially immunized.

Passive immunization is generally used both for treatment and protective purposes in diseases like tetanus, diphtheria, etc.

Immunization is the most important and the least difficult method to adopt for the prevention of disease in the community. Mass vaccination and inoculation campaigns are undertaken all over the world to raise the resistance of a community against diseases like smallpox, cholera, plague, etc , which may assume epidemic proportions from time to time.

Also, individuals should get themselves and their children immunized against the common infectious diseases like smallpox, diphtheria, whooping cough, polio, T.B., etc. Vaccinations or inoculations are given to induce immunity. These involve the introduction of "*Vaccine*" into the body. The vaccine induces the body to build up its own antibodies. Vaccine contains *antigens*. An *antigen* is a substance which stimulates the body to produce antibodies.

Antigens in the vaccines may be :

(1) Living weakened organisms as used against smallpox and rabies.

(2) Killed organisms as used against typhoid, cholera, whooping cough, etc.

(3) Toxins as used against diphtheria, scarlet fever, etc.

Prevention is always better than a cure. So it is much wiser for us to protect ourselves against diseases rather than to take the risk of getting them and then running to the doctor.

The table given on the previous page gives a plan of Immunization against Communicable Diseases.

Summary

The human body is very well equipped to fight harmful disease-producing organisms.

The skin and mucous membranes constitute the body's first line of defence. The white blood corpuscles along with the lymph nodes form the second line of defence, while the antibodies of different kinds, serve as the third line of defence.

Immunity is the power of resistance of the body to disease. It may be natural or acquired. Acquired immunity may be active or passive. Immunization is a very powerful tool for the prevention of disease. Vaccinations or inoculations are given to protect people against diseases like smallpox, tuberculosis, cholera, diphtheria, whooping cough, plague, typhoid, etc. An antigen is a substance that stimulates the body to produce anti-bodies. Vaccines contain antigens in the form of dead or weakened bacteria.

I. Essay Type and Short Answer Questions

1. Define the terms immunity, antigen and antibody.
2. Briefly discuss three ways in which the body fights disease-producing organisms.
3. What is the difference between active and passive acquired immunity ?
4. What is meant by immunization ? How is it useful in controlling the incidedce of infectious diseases ?

II. Objective Type Questions

(*a*) Complete the following :

The skin protects our body against..... bacteria from the outside.....A number of glands pour their secretions on the surface of the skin. These secretions contain substances called.....which kill the bacteria when brought into contact with them. The digestive and respiratory systems are lined internally by a protective layer of .....which secretes a slimy fluid called.....The cells in the internal lining of the respiratory tract also have hair-like projections called the..... When dust practicles or other.....bodies enter the respiratory passages, these force them out by causing one to.....or.....

(*b*) Place the number (or numbers) of the term in column B against the idea it expresses in column A.

Column A	*Column B*	
Poisonous substance formed by some bacteria	Agglutinins	(1)
Protection given when body forms its own antibodies	Tear	(2)
Inoculation with a mild form of smallpox	Immunity	(3)
Causes the body to form antibodies.	Active Immunity.	
Destruction of disease germs	Vaccination	(5)
Eyes produce a substance for destroying microrganisms	Disinfection	(6)
The power of the body to resist disease	Antigen	(7)
Cause the clumping of invading bacteria.	Toxin	(8)

(*c*) *True-False*. Mark true statements (√). Mark false statements (×) :

1. Some bacteria form poisons called toxins.
2. Injection of antigens gives active immunity.
3. Injection of antibodies gives active immunity.
4. Natural immunity can be inborn or acquired.
5. The effectiveness of cholera vaccine is for six months.
6. The lymph nodes form a part of the lymphatic system.

Activities

Make suitable posters to highlight the following :

(*a*) Body Defence Mechanism..... and diseases.

(*b*) Man, Environment versus organisms of infection.....

□

CHAPTER 15

Health Morbidity and Mortality in India ; National Health Programmes

Health is fundamental to national progress. When considered in terms of resources for economic development, nothing can be considered to be of greater importance than the health of the people. It is a measure of their energy and capacity as well as potential man-hours for productive work in relation to the number of persons maintained by the nation.

Morbidity and Mortality

The level of health in India has been low due to a large degree of preventable morbidity and mortality. These in turn have been due to lack of proper environment and sanitation, improper facilities for medical care, inadequate preventive services to all members of the community, inadequate nutrition both in quality and quantity and finally lack of health education The conditions were made worse by illiteracy, ignorance, poverty and superstition.

Mortality means loss of life on a large scale (the number of deaths in a given period).

Morbidity means prevalence of disease in an area, district or country.

Public health is a "purchasable commodity" and modern public health programmes will depend upon the capacity of the community to earn and pay.

Infant mortality in India was found to be very much higher than in most countries while the expectation of life at birth has been found to be very much lower than in most countries. Phenomena like infant mortality and expectation of life are the indices of the fitness of environmental, social, institutional and cultural needs of a society.

Progressive and advanced countries have done much to accomplish in reducing the various mortality figures to the minimum. In progressive countries the expectation of life for females is also higher than for males but in India the position is reversed due to causes associated with child bearing. Also

deaths among infants and children under 10 years of age show that nearly 50% of the deaths are amongst children of 10 years of age or under and of this 50% take place in the first year of life.

Further in India, 40% of the population is in the age group 0-15 years, 50% in the age group 16-50 years and only 10% over 50 years. The population of old people is much higher in the west. India's population is a growing population and not an aging population unlike the west. A growing population has the following drawbacks - lack of mature persons, lack of monetary and scientific movement etc.

In India 200,000 mothers's die from causes associated with pregnancy and child-birth, whereas some 4 million mothers suffer from varying degrees of disability and discomfort, 2 million people die from malaria every year and 100 million suffer from it. Similarly 500,000 die from tuberculosis while 2·5 million suffer from it.

As regards the incidence of disease malaria has constituted 61%, measles 10%, diarrhoea and dysentery 38%, other fevers 10%, typhoid fever, influenza and pneumonia 0·6% of total sickness. 4 4% population had hookworm infection and 3 7%round worm. Deficiency of haemoglobin is also widely prevalent.

The morbidity rate is found to be the highest in infancy and fairly high in the lower age group.

India can be said to be the largest reservoir of infection of cholera, smallpox and plague. Their morbidity and mortality rates vary from year to year. In addition there are endemic diseases like leprosy, filariasis, guinea worm and hookworm.

The burden imposed by preventable diseases is heavy because they result in a loss of production and lead to a lot of expenditure on medical and institutional care. Fortunately, the figures cited above are mostly pre-Independence figures. The story is not so grim now because considerable progress has been made due to the implementation of the Five Year Plans.

The Planning Commission gave a high priority to health in the general plans as follows :

(*i*) Provision of water supply and sanitation.

(*ii*) Control of malaria.

(*iii*) Preventive health care of rural population through health units and mobile units.

(*iv*) Health services to mother and children.

(*v*) Education training and health education.

(*vi*) Self-sufficiency in drugs and equipment.

(*vii*) Family Planning and population control.

As a result of the measures undertaken during the two Plans (First and Second Five Year Plans) considerable improvement had been achieved in the health of the people. The following

table gives the relevant figures :

	1951-56	1956-61	1961-66
Birth rate	41·7	40·7	39·6
Death rate	25·9	21·6	18·2
Growth rate	15·8	19·1	21·4
Infant mortality rate	154·0	135·0	121·0
Expectation of life at birth	37·6	41·9	46·5

Since then there has been further improvement. It is hoped the trend will be maintained and India will compare favourably with advanced countries in matters of public health in due course of time.

NATIONAL HEALTH PROGRAMMES

1. National Malaria Control and Eradication Programme. Malaria was one of the devastating diseases in India prior to 1947. It was estimated that the number of victims was 100 million of whom, over a million died. In order to deal with this great problem a National Malaria Control Programme was launched by the Government of India in 1953.

This programme involved intensive indoor spraying of insecticides in malarious areas. There was a drastic reduction in the incidence of the disease—from 75 million cases in 1952-53 to 19 million in 1955-56 and 1·1 million in 1959-60.

This programme was converted into National Malaria Eradication Programme in April 1958. It is a phased campaign consisting of an intensive period of spray operations for at least 3 to 5 years. The programme is being assisted by WHO and USAID. At present, 393,250 units each covering a population of 1·3 to 1·5 million are functioning in the country.

The National Institute of Communicable Diseases in Delhi is responsible for research and for the training of staff in methods of malaria eradication.

2. National Filaria Control Programme. This was launched in 1955 and comprises mass administration of drugs to people in filarious communities and adoption of anti-mosquito measures. As a result of surveys it is estimated that over 13·6 crore people live in filarious areas of the country. At present 6 Headquarters units one each in Andhra Pradesh, Madhya Pradesh, Goa, Karnataka and Kerala are functioning in the country. A centre for practical demonstration and field training is functioning at Kozhikode and a new training centre has been started at Rajahmundry.

3. National Tuberculosis Control Programme. National T. B. survey completed in 1958, showed that nearly 50 lakh persons suffer from active or probably active T. B.

The WHO and UNICEF render assistance in the form of B.C.G. kits, vehicles, etc. There are now 216 B.C.G. teams, 15 demonstration and training centres have been established. Training is also imparted in other institutions and centres. 3 mobile X-ray units have been procured and supplied to Agra, Madras and Calcutta. A National T. B. Institute was started

in March 1959 at Bangalore with the assistance of WHO and UNICEF. There are 140 sanatoria and hospitals; 427 clinics, 152 wards and over 36,581 beds available for T. B. patients.

4. **National Leprosy Control Programme** was launched in 1954-55. The number of leprosy cases in India is now estimated at about 25 lakhs. As such nearly 20% of the world's 11 million lepers live in India.

The areas of high incidence are Andhra Pradesh, Bihar, Kerala, Madhya Pradesh, Tamil Nadu and certain parts of Maharashtra, Uttar Pradesh and West Bengal.

221 Leprosy Control units, 1396 Survey Education and Treatment Centres, 12 Training Centres and 32 Voluntary Agencies are functioning in the country.

A number of voluntary organizations like Mission to Lepers, Hind Kusht Nivaran Sangh, Ramakrishana Mission are also engaged in anti-leprosy work.

5. **The National Small-pox Eradication Programme** was launched in 1962. Under this programme 154 eradication units are working in the country. Four institutes located at Patwadnagar (U.P.). Guindy (Tamil Nadu), Belgaum and Hyderabad were selected for the production of freeze dried vaccine.

6. **The National Trachoma Control Programme** was launched by the Government of India with effect from March 1963.

7. **Influenza Centre** was opened in 1950 at the Pasteur Institute, Coonoor. A pilot plant set up there in 1954, produces influenza vaccine and seeks to improve the method of its manufacture.

8. **Venereal Diseases.** A Central V.D. Advisory Committee was constituted in 1963-64. 142 V.D. clinics have been established in the country. It has been found that about 5% of the population suffers from syphilis and another 5% from gonorrhoea. Free supply of V.D.P.L. antigen and vials of P.A.M. are made to various V.D. clinics. P.A.M. is an imported item.

9. **Yaws.** Yaws teams are continuing their operation in the states of Madhya Pradesh, Andhra Pradesh, Orissa and Maharashtra.

10. **Cancer.** The Government utilizes all Cancer Research Institutes of the country for the treatment and research on cancer. Cancer research and treatment are being carried on by the Indian Cancer Research Centre, Bombay, Chittaranjan National Cancer Research Centre, Calcutta, Tata Memorial Hospital, Bombay, and Cancer Institute, Madras.

Cobalt Beam Therapy units are available in 18 hospitals in the country.

11. **National Family Planning Programme.** The population of India was fairly steady from 1881 to 1921 due to various factors, like epidemics, famines, floods and other catastrophies. From 1921 upto 1951 there was a steady increase in the growth of population. The current growth rate is

roughly 2% per annum. The present population is about 700 million and if population growth is not checked it may touch the 1000 million mark by the turn of the century. This tremendous increase in population is having its repercussions on food, land, housing, health and economy of the country.

Family planning, therefore, is considered to be an essential programme for the well-being of the people and a very high priority has been given to it in the National Health Programmes. The main goal of family planning in India is to reduce the birth rate of 40 per 1000 population by 50 percent (to 20 per 1000) as quickly as possible.

The programme originally consisted of four components *viz* service, training, education and research. Family planning advice is offered in clinics established at the district, taluk and peripheral levels and in Maternal and Child Health Centres.

Today, emphasis is being laid on (*a*) extension approach *i.e.*, providing extra clinical agencies, utilization of village leaders to motivate the eligible couples (about 160 per 1000 population who need to practice family planning) to accept and practice family planning, making contraceptives easily available through depot holders, etc., (*b*) sterilization operation preferably in males. Because this is simple and easy to carry out, and (*c*) spacing and limitation by mass scale use of intra-uterine contraceptive device (commonly known as loop) by the females.

Summary

Health is fundamental to national progress. The health of the people of a country is of great importance for its economic development. The level of health in India has been low due a high incidence of preventable diseases and a high rate of mortality. The factors responsible for this state have been inadequate nutrition : lack of health education, poor sanitation and inadequate medical facilities for the community at large. Pre-indepedence conditions were poor as regards health morbidity and mortality but considerable progress has been made since Independence due to the high priority given to Health by the Planning Commission in its developmental plans.

The National Health Programmes include the following :

National Malaria Control and Eradication Programme. National Filaria Control Programme, National Tuberculosis Control Programme, National Leprosy Control Programme, National Small Pox Eradication Programme, National Trachoma Control Programme, Programmes for the Control of Venereal Diseases, Cancer and Influenza and the National Family Planning Programme.

I. Essay Type and Short Answer Questions

1. Write suitable definitions of the terms health, mortality and morbidity.

2. Why has the general standard of health in India been so low ?

3. List the important National Health Programmes.

4. What factors have been responsible for lowering the infant mortality rate in India ?

II. Objective Type Questions

Fill in the blanks in the following :

1. The level of health in India is low due to.....and.....

2. Public health is a ".....".

3. In India life expectancy in.....is lower than in males because of causes associated with.....

4. A growing population has drawbacks like lack of mature persons, lack of.....and .....investment.

5. In India two million people suffer from.....whilst two and a half million suffer from.....

6. India has the largest reservior of infectious diseases like.....and.....

7. Considerable progress to raise the standards of health has been made due to the Five.....

8. The Planning Commission has given a .....priority to.....in the general plan.

Activities

1. Make sketches of the stages in the life history of the Anopheles and Culex Masquitoes.

2. Make posters of the following :
   (*a*) Population Explosion
   (*b*) Control of Malaria and Filaria.

3. Things to know—Look up the Encyclopaedia and find out about Edward Jenner ; Sir Ronald Ross and Louis Pasteur.

"Learn from the beasts the physics of the field"

—Pope

Consumer Education

CHAPTER 16

The Medicinal Systems and Modern Drugs

A knowledge of medicine has existed from ancient times. From the dawn of history man has sought to cure diseases by use of medicinal plants. The Egyptians, Greeks, Romans, Chinese, Arabs and Indians developed their own 'Systems of Medicine'. Modern medicine has its origin from Greek medicine. In our country various systems of medicine prevail such as the Ayurvedic System, Unani System, Siddha System, Homeopathic System, Nature Cure System and Allopathic System.

1. Indian Medicine and Surgery. The source of this is derived from Atharva Veda. Dhanwantri is the Creator or God of Indian medicine. Sushruta was regarded as the Father of Surgery. Surgery is that branch of medical science which treats diseases by removing the diseased areas by operation. Charaka was the Father of medicine, which is another branch of medical science that treats diseases by the of use internal and external remedies. In Ayurveda emphasis is laid on diet control, use of herbal and mineral remedies, medicated oils and

ghee. Surgery in India was quite advanced since operations were performed, wounds stitched, foreign bodies were removed. The surgical tools used were knives, scissors, saws, needles and forceps, and such types of tools are still being used in modern surgery.

1. **Ayurvedic System of Indian Medicine.** This system revolves round three substances that are present in the body. These are Wind (Vayu) Pitta (Bile) and Phlegm (Kapha). According to Ayurveda, diseases occur as a result of faulty diet, mental tension, and unhygienic habits. The cure for this lies in removing the toxins from the body and maintenance of homeostasis. Ayurvedic doctors insist upon certain health rules such as personal hygiene, early rising, physical exercises etc.

2. **Unani System.** This system of medicine was developed by the Arabs and is partly based on the Greek System. The word Unani is derived from the Greek word Ionian as early Greece was known as Ionian Isles. This system is found in Arabian and Persian books of medicine. It is based on the theory that every individual has a unique combination of humours that shows one's healthy state. Any change in this combination produces an illness.

The *Humours* produced from digested food are as follows :
Blood (*khoon*), Yellow bile (*sauda*), Black Bile (*safra*), Phlegm (*balgam*).

The temperament of an individual depends upon these humours. A person with lots of blood has a *calm* temperament. A person with lots of phlegm is *phlegmatic*, a person with lots of bile is *angry* and one with lots of black bile is *depressed*.

In the Unani system of medicine importance is placed on the body's defence mechanism for protection against disease. Unani medicines are mainly herbal though there are drugs of mineral and animal origin as well. The Unani doctors attach great importance to diet and digestion both in health and disease. Since faulty diets upset the balance of the humours in the body. they prefer to use simple, crude drugs which can be obtained easily to suit the temperament of every patient. This ensures a speedy recovery according to the doctors of Unani medicine.

3. **Siddha System.** The basic principles of this system are based on the Ayurvedic system of medicine. This type of medicinal system prevails in Tamil Nadu and in parts of Kerala. Most books on this are written in Tamil. The Siddha system considers certain factors such as diet, sleep, mental health, seasonal conduct and social conduct are essential in order to maintain positive health.

4. **Nature cure.** This system is based on natural philosophy. The form of treatment in this consists of hydrotherapy, fasting, use of enema if constipated, green vegetables in the diet, massage etc.

5. **Homeopathic System.** Dr. Samuel Hahnemann, the father of

Homeopathy developed this system. Homeopathic medicines are taken in a dilute form rather than in strong doses. The basic principle of homeopathy is "*Let likes be treated with likes.*" This means that homeopathy is a system of treatment by which diseases are cured by drugs which produce effects on the body similar to the symptoms of diseases. Minute doses of those medicines mobilise the defence mechanism of the body against the offending disease processes. The results are rapid, gentle and ensure a permanent state of health. Homeopathic treatment does not conflict with surgery, physical therapy or any other non-medical measures.

6. Allopathic system. In this system the physicians often undertake investigation of an ailment, a diagnosis is made leading to the treatment of the disease through drugs. The principle of Allopathy is based on detection, prevention, immunisation and control by drugs. This system is most popular all over the world. It has advanced so much and has specialisations for each organ or groups of organs in the body.

The specialisations deal with health problems of particular age groups, use of specific therapeutic procedures, problems of incidence, distribution, control and prevention of diseases; and health problems involved with specific environments such as sailing or flying.

Specialisations available in the Various Systems of Medicine

A well-informed person should know the names of the various specialities in medicine, the nature of the work involved in each type and what each specialist is called Many new fields of specialisation are opening. These may be research projects or be involved with the direct care of the patient, these can also include teaching in Medical Colleges, Industrial and Public Health Institutions.

Development of New Drugs and their Role in Controlling the Incidence of Disease

Today new drugs are given immense publicity. These have developed during the last 15 years. What is a Drug ? A drug is a complex chemical substance foreign to the body. There are certain specific drugs used to destroy microbes and this line of treatment is known as *Chemotherapy*. The drug in this case destroys the microbes and at the same time is harmless to the body.

Most of the drugs are used in diagnosis or treatment of various diseases and to relieve pain and discomfort. Drugs are obtained from plant, animal and mineral sources. Synthetic drugs are made in laboratories.

The essential drugs are as follows :

The Anti-biotics are a new group of very selective anti-bacterial agents. They either kill or stop the multiplication of many kinds of disease micro-organisms without injuring ordinary cells and tissues In 1928, Sir Alexander Fleming discovered Peni-

cillin the first antibiotic from a green mould called Penicillium. Penicillin is effective against various types of infections Other antibiotics are streptomycin, aereomycin and terramysin. An antibiotic which is effective against a wide range of infections is knownas a *Broad spectrum antibiotic*, for example the *Tetracylines*. Great care has to be taken in the administration of these antibiotics for too much may harm the patient by production of more dangerous, resistant types of bacteria in the body. So antibiotics are not meant for self-medication as they cause allergy or other dangerous reactions.

Other forms of drugs are the powerful *Sulpha* drugs such as Sulphadiazine, Sulpha guenadi-nine. The *Analgesies* are the pain killers with their basic chemical Aspirin. There are drugs for various infections like Tuberculosis, Dysentery, Leprosy etc. *Hormones* are used in the treatment of illness, for example, Insulin for diabetes. *Vitamins* both the fat and water soluble types are also produced in chemical factories besides being obtained from natural sources.

Modern drugs may be prescribed in the form of liquids, mixtures, tablets, capsules, injections, drop inhalations etc. These drugs have to be handled with great care for indiscriminate use of them may cause either temporary or permanent harm or even death They may be *Prescribed drugs*, that is prescribed by the medical practitioner or *Non-prescribed* drugs which are used for minor ailments such as a headache, common cold, pain in the body etc. One should follow directions given by the doctor or on the label carefully before the drug is taken. Thus if treatment by drugs is to be safe, it should be based on the expert diagnosis by the doctors and the subsequent careful follow-up of the doctor's instructions for complete recovery from an illness.

Summary

A knowledge of medicine existed from ancient times. Even primitive man used the plants around him to cure illness. The Greeks and Egyptians were the pioneers of medicine. India can boast of being eminent very early in the Ayurvedic System of Medicine. The Arabs influenced Unani Medicine. The sources for these drugs are animals, plants and minerals. Later Homoepathic Medicines became popular with their weak potency and "LIKE-CURES LIKE-EFFECTS".

The modern medicines with their specialised drugs like the Antibiotics, Sulpha drugs, Hormones and the Vitamins play a vital role in maintaining the health of the nation today. It is now clearly understood that the signs and symptoms of a disease are the body's own defence mechanism. Modern medicines are prepared scientifically in chemical laboratories.

I. Essay Type and Short Answer Questions

1. Mention the important systems of Medicine and describe them briefly.
2. In what ways does the Homoeopathic system differ from the Allopathic system ?
3. Write a note on the Modern drugs.
4. "Antibiotics bring a speedy relief to the sick"—Discuss.

II. Objective Type Questions

(*a*) Fill in the blanks in the following :

Vitamins are both types.....and .....Some Analgesics are known as the .....They are effective against headaches,.....and.....The popular ones are.....and..... Certain hormones are used in the treatment of diseases. These are.....and.....

(*b*) ***True-False.*** Mark (√) against true statements and (×) against false statements.

1. Medicine and surgery are specialised fields of study.
2. A drug can be used to cure all ailments.
3. The elements are important in Unani medicine.
4. One should be careful in the use of modern drugs.
5. Drug reaction occurs in some people.
6. An antibiotic is a living organism.
7. Chemotherapy is the use of certain drugs for a specific line of treatment.
8. Sir Alexander Fleming discovered penicillin.

Activities :

1. Collect some medicinal plants from your environment. Dry them and put them in an album.
2. Cut out advertisements of drugs from magazines or newspapers and stick them in your record book.

□

CHAPTER 17

Habit-Forming Drugs

The practice of regularly taking certain substances which are not required by the body is very widespread. Such people are known as *Addicts* One type of drug generally taken by them are known as the *Narcotics*, such as Opium, Morphine, Heroin and Cocaine. These are taken by certain people because they are unable to face certain situations in their life. Therefore they may take these drugs in excess or illegally. This is known as *Drug Abuse*. Cocaine and Opium are also pain killers. When taken in moderation they allay sensation, relieve pain and produce profound sleep, but in excess produce stupor, coma or convulsions. So if an addict does not take these drugs regularly, depression and nervous symptoms occur. Finally this has an adverse effect upon the physical, mental and moral health of the user. The craving for such drugs by an addict can be given up with the greatest of difficulty. These drugs like caffeine if prescribed by the doctor and taken in small quantities have a stimulating effect. Narcotics are used by means of the hypodermic needle, or as a liquid, or a snuff, tablet or a powder, spray or as a cigarette.

Narcotic drugs are sold only against a medical prescription. There is restriction with regard to their manufacture, sale and import. The Drug control organisation in collaboration with the Narcotics and Excise Departments imposes these restrictictions.

Other drugs which may lead to drug abuse are *Depressents* such as the Bromides and the Barbiturates These affect the Central Nervous System by giving a soothing effect freeing a person from stress and strain. However an indiscriminate use of these is extremely dangerous causing addiction or even death.

Stimulants are those drugs which increase. The functional aspect of central nervous system by inducing excitement producing loss of sleep and appetite. This lasts for a limited period only and hence an addict requires more and more of them in order to avoid spells of depression.

Hallucinogens such as L.S.D are derived form wheat and Rye fungus and D.M.T from the skin of toads. The effects of these drugs causes Illusions and Hallucinations that is an addict cannot make out the

difference between a fact and a fantasy. Thus one's mental and visual outlook gets distorted. Such illusions produced in the victim may lead to antisocial acts like stealing, crimes murder or even fatal accidents. It is a sad state of affairs to note that modern youth has a great affinity for such types of drug addiction.

Smoking

"A cigarette is the perfect type of a pleasure. It is exquisite and it leaves one unsatisfied. What more can you want ?" —*Oscar Wilde*

Tobacco. It is got from the leaves of the tobacco plant called *Nicotiana tabacum*. The leaves of this plant are prepared and used for smoking or chewing or as a snuff. The manufactured products from the tobacco leaves are the cigar cigarette, and the beedi. The habit of smoking tobacco is spread all over the world. Tobacco smoke contains nicotine and carbon mono oxide. So numerous scientific studies have been conducted to find out whether smoking is a health hazard.

Effects of Smoking

It has been proved that tobacco smoking particularly cigarettes has been the cause of a shortened life span. Cigarette smoking in excess can cause digestive upsets, affects the heart and blood vessels, causes irritation and sleeplessness. Prolonged excessive smoking is regarded as an important factor in the development of cancer of the larynx and lungs and it is believed to be related to cancer of the bladder, Oesophagus and oral cavity. As the smoke is drawn into the lungs through the breathing passages, the gases and particles in the smoke settle into the surrounding membranes, so that these membranes get thickened, the cilia on them get damaged and lose their capacity to remove the toxic and irritating chemicals introduced by the inhalation of smoke. The thickened membranes can reduce the air flowing into the lungs because the passages become narrow. Moreover, harmful particles from the tobacco smoke get deposited in the air-sacs of the lungs. The voice-box or larynx get thickened with the often-swollen vocal cords. This causes irritation and increased secretion which results in the smoker's cough". Other effects of tobacco smoking are tobacco allergy in sensitive people and an increase in stomach ulcers. Thus smoking affects the health and shortens life. Cigarette smoking has a greater effect than the Cigar or Pipe smoking. Cigar and Pipe smokers often do not inhale the smoke and the temperatura at which the tobacco burns is different. Filters and denicotinisation of tobacco or cigrettes does not remove the hazards of smoking but can only reduce them.

Smoking is generally related to a social or an intense situation. This is the reason given by smokers. Young people smoke in imitation of their elders, or to show freedom to do as one pleases or as a reaction against authority. Most people agree that never to smoke is the best thing for once the habit is formed, it is not easy to quit smoking. Success depends on wanting

to quit, will power and the use of various methods to break this habit pattern. Therefore a smoker should have strong motivation, and a good reason in order to quit smoking. Once a smoker decides to do this seriously, there should be no wavering but firmness in his decision because finally nothing succeeds like success.

Alcohol

"The smaller the drink, the cleaner the head and cooler the blood".

—W. Penn

It is the most widely taken of these drugs. It is made by a process known as *Fermentation*. A substance Yeast, a living, growing activity multiplying organism, is added to any solution containing sugar. The sugar is changed by the yeast into Carbon-dioxide and Alcohol Various *Ethers* and *Acids* are also formed in this process When cane sugar, grape sugar and barley are fermented Rum, Wine and Beer are made. The table given below shows the percentage of Alcohol in the following :

Brandy 55%	Sherry 23%
Whisky 54%	Port 22%
Rum 53%	Beer 3%

Effects of Alcohol

The addiction to alcohol is known as *alcoholism*, which has become a major chronic disease and a social problem. Alcohol is taken because of its taste or being in the company of habitual drinkers or as a social obligation. In *small* quantities alcohol stimulates the heart, digestion and the nervous system. Later it may cause depression ; if it is taken by social assent by certain people then this habit can be given up. But if it is taken as a relief from mental anxiety or distress, then to give it up proves very difficult Alcohol is not a stimulant but an anaesthetic. The effects of alcohol are on the brain so that the centres of self control, judgment ; conscience and actions get dulled. So drinker usually talks and acts recklessly and is easily led into all types of anti social conduct. When more and more of alcohol is consumed and its level increases in the blood, coordination of muscles decreases so that walking or driving a car becomes difficult. Speech becomes slurred and the eyes cannot focus properly. In large amounts it acts as a poison on the liver, stomach, heart and the nervous system. Since alcohol is a strong chemical, it may damage other delicate body tissues, if constantly present in the blood and body fluids. Alcoholism affects the individual's personality, social status, and family relationships. An alcoholic loses self-respect and pays no attention to his looks as a result of which he is unshaven, shabby and dirty. Moreover, he arouses distaste and dislike amongst those with whom he comes into contact. The cultural and environmental factors are supposed to be responsible for alcoholism.

The treatment for alcoholism is based upon two important factors : one is that the individual must recognise his problem and try to correct it. Secondly, the family and friends of the

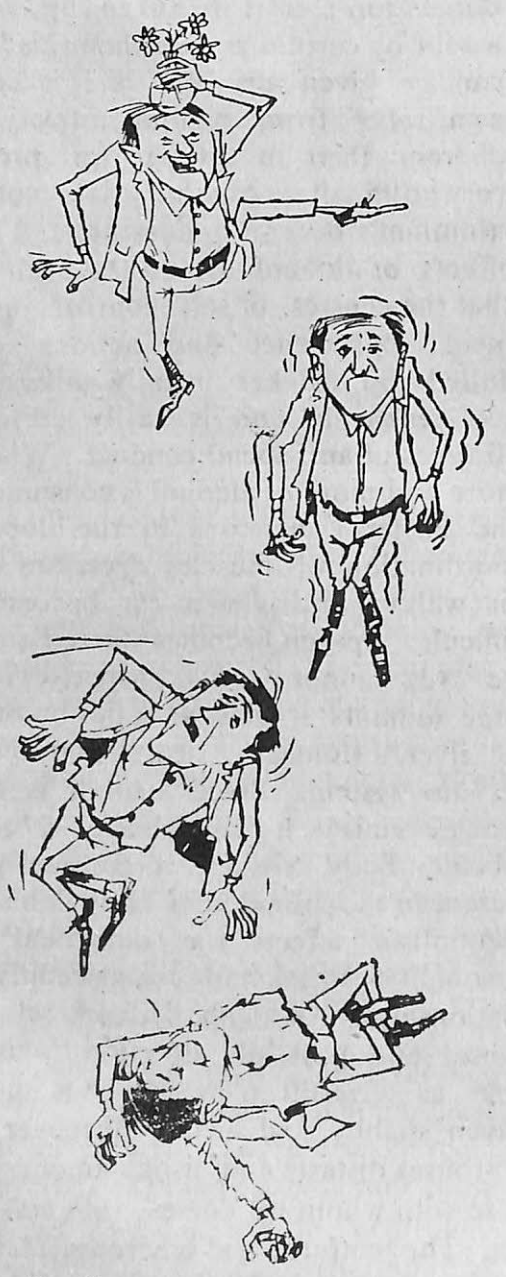


Fig. 18.1—Addiction and bulk alcohol consumption brings disaster

alcoholic should consider it as a disease and not as a perversion to be cured by punishment. Various drugs like tranquilisers and sedatives are used to keep the patient calm, refreshed and to provide restful sleep. Counselling has also been accepted as an important step Hypnosis has been tried in some cases, but this should be done only by a trained psychiatrist. An organisation known as *Alcoholics Anonymous* renders service in the cause of alcoholism. It bases its services on complete personal understanding of the alcoholic derived through personal experience. Each member of this group has been an alcoholic previously and so demonstrates to the others how one can give up this habit and become a useful member of society.

Alcohol has absolutely no food value. Money spent on alcoholic drinks is money wasted. It can be a valuable medicine for a short time, only if prescribed by a doctor. As an addiction it results in poverty, misery, crime and finally insanity. Therefore, an addiction towards it should be wiped out so that an individual free from addiction would develop his personality, social status and lead a happier and useful life with the members of his family.

Summary

Certain laws control the sale of certain poisonous types of drugs. These are the narcotics for example Opium, Morphine, Heroin, etc. When such drugs are taken in excess it is known as *Drug Abuse*. Some drugs become habit-forming like Tobacco and Alcohol. The people who have a tendency to

use of these regularly by anyone becomes what is known as *addiction* and the user is an *addict*. In these habit-forming drugs, the craving for them becomes so intense that there is difficulty in giving them up. If an addict does not take these drugs regularly, depression and nervous symptoms invariably occur. Finally this has an adverse affect on the physical, mental and moral health of the user. A drug addict should have strong motivation and will-power and he should make a serious effort to break this habit pattern. Only then will success be achieved otherwise misery will be the outcome of this addiction from the physical, mental moral and spiritual points of view.

I. Essay Type and Short Answer Qesstions

1. What is meant by drug abuse ?

2. What do you understand by these words "Habit-Forming drugs" ?

3. Mention the ill-effects of Smoking and Alcoholism. Write your answer in points.

4. What are Narcotics ?

II. Objective Type Questions

(*a*) Complete the following sentences :

1. Certain drugs are taken in excess and this is known as.....

2. Narcotic drugs are only sold against a medical.....

3. The Excise Department imposes restrictions on the sale of.....

4. Other drugs that cause addiction are....., ..., and.....

5. Tobacco smoking particularly cigarettes shortens.....

6. Excessive smoking can cause diseases like.....

7. Alcohol is made by a process called.....

8. The effects of alcohol are on the brain so that the centres of.....

9. Alcoholism has become a major.....

10. An organisation known as "Alcoholics Anonymous" renders.....

(*b*) *True and False* : Mark (✓) for true statement and (×) against false statement.

1. The practice of taking certain drugs regularly is known as addiction.

2. Cocaine and Opium are pain killers.

3. Tobacco is got from the leaves of a plant.

4. Smoking has become a social grace.

5. Young people smoke in imitation of their elders.

6. Smoking and drinking are good habits.

7. Ethers and Acids are formed during the manufacture of Alcohol.

8. The habit of taking sedatives and tranquilisers is not good.

9. Alcoholism results in misery, crime and insanity.

10. Drug addiction does not allow the personality of an addict to be developed.

Activities :

1. List out the Narcotics used by the Youth today.

2. Cut out advertisements, pictures, etc., from newspapers, and magazines of the different brands of cigarettes and alcoholic drinks. Stick them on a chart paper. Ask your teacher to put up your chart on the class Bulletin Board.

CHAPTER 18

The Doctor Versus The Quack

Introduction

Medicine and Surgery are specialised fields and are of vital importance the role they play towards maintenance of health. If these are practised by unqualified persons, serious complications may arise causing even death Therefore it is very essential that an elementary knowledge of the various systems of medicine and specialisations in this particular field is made available In our country today the importance of intelligent use of Drugs is realised so that health can be restored and preserved. Steps are being taken at the Central and State levels to prevent drug abuse as well as reduce mortality.

Importance of going to the Right Place and Person for Health and Medical Services

Since modern medicine has become highly specialised now, it is very important for us to go to the correct doctor. We should consult our family doctor as soon as we feel unwell. He would then refer us to the right specialist, if he thinks such advice is required. A correct diagnosis of a disease is very important for correct treatment. This consists of doing various test of blood, urine, sputum, stools etc. X-Rays also help in making a correct diagnosis. After getting the results of all these a correct line of treatment is chalked out by the doctor Further it is very important to have our disease diagnosed early because even most of the serious diseases like Cancer, Tuberculosis, Leprosy etc., are curable, if detected in the early stages. If we neglect our health and allow the disease to get advanced then we will suffer more and may never get well at all.

Once the disease has been diagnosed and treatment prescribed we should follow the doctor's instructions faithfully and carefully in order to get well quickly. We should never try self-medication or take drugs suggested by our friends. This may cause a lot of harm. Even more dangerous is the taking of prescription drugs prescribed for a previous illness or for another person whose illness "seemed like yours".

Specialisations are available in the various systems of medicine and medical services. So it is essential that a well informed person should

S. No.	Name of Specialisation	Nature of Specialisation	Name of Specialist
1.	Anaesthesiology	Administration of Anaesthetics and other drugs that produce loss of sensation or unconsciousness.	Anaesthesist
2.	Colon and Rectal Surgery	Operative correction for diseases of Colon and Rectum.	Colon and Rectal surgeon
3.	Dermatology	Treatment of diseases of skin and scalp	Dermatologist
4.	General Practice	Treatment of whole body through non-surgical means.	General practitioner
5.	General Surgery	Operative correction of diseases of the body not limited to specific areas.	General Surgeon
6.	Neurological Surgery	Operations for various conditions of brain and spinal cord.	Neurological Surgeon
7.	Neurology	Diagnosis and treatment of diseases of the nervous system	Neurologist
8.	Obstetrics and Gynaecology	Specialisation in pregnancy and child-birth, and the treatment of women's diseases.	Obstetrician and Gynaecologist
9.	Orthopaedic Surgery	Surgical and medical treatment for deformity, fracture and disorders of bones.	Orthopaedic Surgeon
10.	Ophthalmology	Surgical and medical treatment for diseases of the eye.	Ophthalmologist
11.	Otolaryngolog	Medical and Surgical treatment for diseases of the ear, nose, and throat.	Otolaryngologist
12.	Pathology	Identification of disease micro-organisms and diseases.	Pathologist
13.	Pediatrics	Management and treatment of children from birth to the teens.	Pediatrician
14.	Plastic Surgery	Surgery to repair and restore various parts of the body.	Plastic Surgeon
15.	Preventive Medicine	Study and control of diseases and health hazards in various fields.	A Medical Doctor
16.	Psychiatry	Interpretation and treatment of mental and personality disorders.	Psychiatrist
17.	Radiology	Diagnosis and treatment of diseases by the use of radiant energy for example the X-Ray and Radio-active isotopes.	Radiologist

know the names of the various specialities in medicine, the nature of the work of each type and what the specialist is known as regarding his own type of work. Many new fields of specialisation are opening, which may be a research project or in the direct care of the patient. It can also include teaching in medical colleges, Industrial medicine or Public Health Institutions.

A Specialist is known in connection with his own type of work

The following are the fields of medicine which have various systems of Specialisations :

Dangers of Going to a Quack

The name Quack is derived from the common duck which means contempt. Actually it is a short form of the term "*Quack-Salver*". Salver means the healer. A quack is a person who does not have any special knowledge or qualifications in medical, science, yet he thinks he has found a cure for one or more diseases. Most of them are fakes but some have found real cures ! A quack never bothers about accurate diagnosis. He works alone. His medicines are supposed to cure a great number of diseases by a single method of treatment. The majority of them are anxious to get rich quickly and so they sell their remedies at high prices. They lose all respect for truth and try to mislead people by direct or indirect publicity. The result of this is that instead of effecting a cure a person may lose health altogether by not taking the best treatment in time. Further, the distress of failure in the patient after, false hopes given by the quack may cause great depression instead. Hence it is advised that we should beware of Quacks, and their *cure all* remedies for various diseases. One should not be misled by their persuasive powers or sheer personality in order to take their "Miracle drugs".

Summary

The responsibility of medical care depends upon the doctor. More so, when modern medicine has become so specialised. The basic family medical care is provided by the family doctor who is mostly a general practitioner. When he feels that the patient needs other opinions than his own, a specialist is called. The doctor prescribes a line of treatment only after correct diagnosis. Several types of tests of urine, blood, sputum, stools, etc. are done before the diagnosis is given.

The techniques of medical care have advanced recently. Therefore, it is impossible for a single doctor to have a complete knowledge about each part of the human body and attain skill in the treatment of them. Doctors therefore, specialise in a particular area in which they are interested. They usually get trained in this after they complete their entire medical course. During their period of specialisation, a doctor works under a skilled specialist in the field of this choice.

The work Quack is the abbreviation of the word "*Quack Salver*" which means to save or heal. In other words it means one who pretends to be a saver or healer and who gives immense publicity to his medical skill, without real knowledge. Medical Quackery is the practice of deceit. A quack guarantees a

quick cure and uses case histories, testimonials to promote his cures. He uses a lot of publicity materials for his miracle drugs. There are specific types of quackery such as for baldness, weight reducing, pep-pills, hormones and for skin troubles, etc.

I Essay Type and Short Answer Questions

1. What steps does a doctor take before the treatment of a disease starts ?

2. Waat are the dangers of self-medication ?

3. How does a doctor specialise in a particular area of medicine or surgery ?

II. Objective Type Questions

(*a*) Complete the following statements :

1. A quack guarantees a quick cure with his.....

2. It is better to get treatment for a disease at an.....

3. Diagnosis of a disease means.....

4. Various tests are conducted before the doctor prescribes... .. ..

5. Self-medication means the taking of.....

6. The trained clinical judgement of the doctor along with tests gives accuracy.....

(*b*) *True False* : Write (✓) for true and (×) for false statements in the following :

1. The strength of any nation is directly related to its health.

2. A quack is a fraud.

3. A specialist is one who is skilled in the field of his own choice.

4. A Psychiatrist treats mental disorders.

5. Weight in adults should be at its highest level.

6. Pediatrics is the study of medicine for children.

Activity

Find out from your doctor how the following tests are done and do them in class with the help of your teacher.

(*a*) Urine test—for sugar and albumen.

(*b*) Test for fats.

Health Organisation in India

Chapter 19— *Medical and Health set-up at District, State and National Level.*

CHAPTER 19

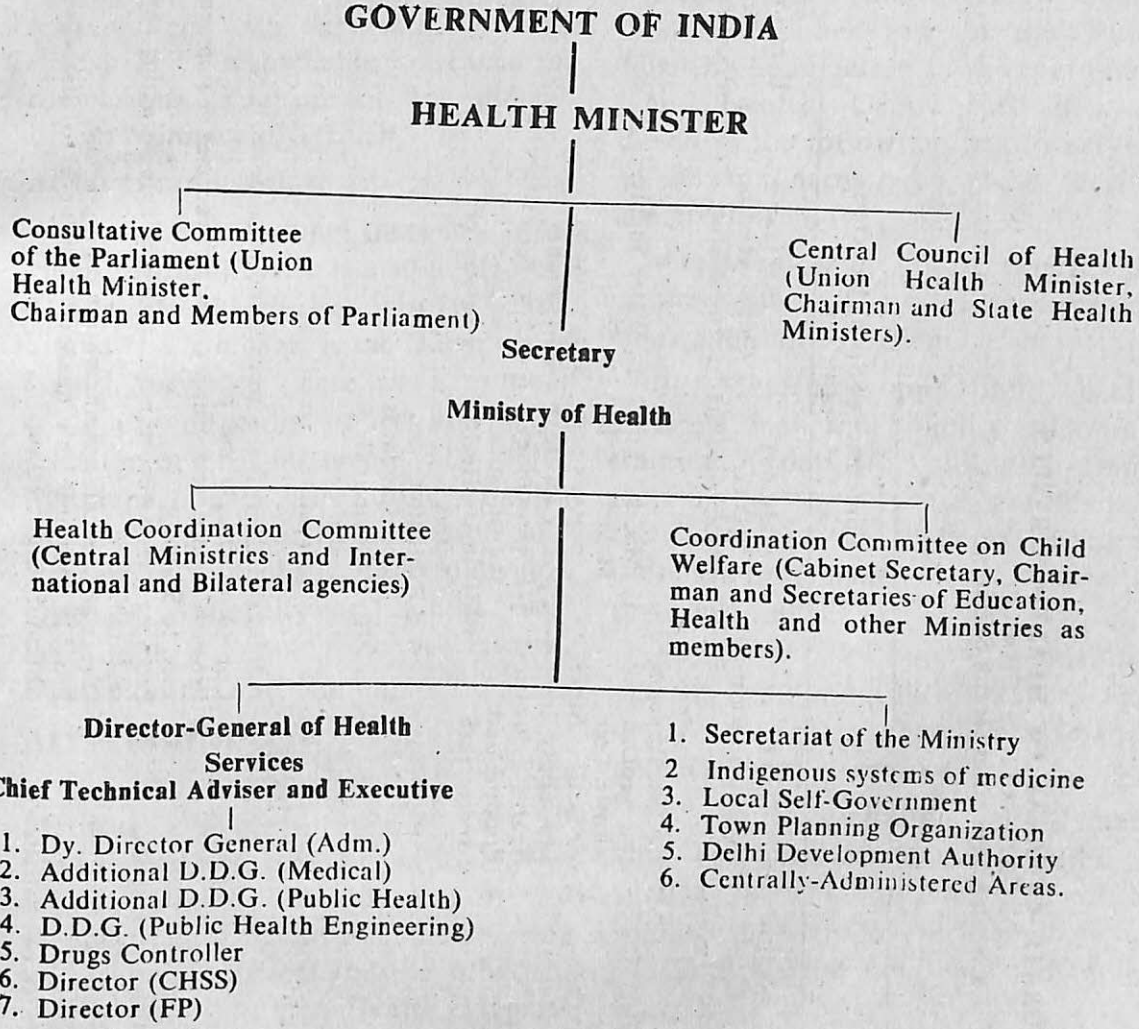
Medical and Health Set-up at District, State and National Level

The standard of public health in a country depends upon its people, its resources and its government. The individual, the community, and the State have specific but complementary roles to play in the protection, preservation and promotion of health.

Role of the State at the National Level

In the Central Government the Health Minister is in-charge of the Ministry of Health and Family Planning. He is assisted by the Central Council of Healh and a Committee of Parliament for dealing with various health problems. The Health Minister is further assisted by the Director General of Health Services who has a number of deputies under him in charge of different departments like Medical, Administration, Public Health, Engineering, Family Planning, Drug Control, etc.

The centre's responsibility in regard to health is limited mainly to matters relating to the international health,



regulations relating to ports, inter-state quarantine and co-ordination, maintenance of drug standards, vital statistics, assistance to and approval of planning and implementing State programmes in the Plan periods and grant-in-aid for State programmes.

States are responsible for their own legislative acts ; for medical, nursing and allied education, for public health and sanitation ; for hospitals and dispensaries and a wide variety of other functions such as pilgrimages and fairs within the State.

However, the Centre gives advice on health and allied matters, co-ordinates health programmes and policies, supplies technical information and equipment and provides financial and other assistance which promote, in general the health and well-being of the country.

The Directorate General of Health

DIRECTORATE GENERAL OF HEALTH SERVICES
(ORGANISATION CHART)

Director-General of Health Services

- **Statutory and Technical Advisory Bodies**
- **Conference of State Directors of Health Services**

Drugs Controller	Director C.H.S.S.	Additional D.D.G. (Medical)	D.D.G. (Administration)	Additional D.D.G. (Public Health)	D.D.G. (Public Health Engineering)	Director (Family Planning)
1. Regional Supervisor 2. Central Drugs Laboratory		1. Hospitals 2. Nursing 3. Medical College 4. Post-graduate training 5. Research 6. Central Library	1. Budget, Personnel and general Administration 2. Medical Stores and supply 3. Health Education 4. Building and Architecture	1. M.C.H. 2 Malaria, T. B, Leprosy, small-pox, V.D. etc. 3. Epidemiology and statistics 4. Primary Health Centres 5. Nutrition and Food Standards 6. International Health and quarantine	1. Water Supply 2. Sewerage 3. Sanitation 4. Training Public Health Engineering Personnel	

FUNCTIONS

General

Direct :—

Surveys, Planning, Coordination, Programming, Appraisals } Relating to National Health matters.

Specific

1. Carry out international health and quarantine obligations.
2. Administer Central enactments and regulations.
3. Control of Drug standards.
4. Procure, store and supply drugs, vaccines, equipment, etc., to States.
5. Promote and coordinate post-graduate training and research.
6. Direct and execute specific national programme.
7. Provide technical and financial assistance to States and voluntary organizations.

Services now is a composite organization staffed with experts in various fields. It is responsible for executing the various programmcs and policies of the Ministry of Health.

At the State Level

In the State cabinet there is a State Health Minister who is also a member of the State Health advisory Board. Under the Minister is the Director of Health Services. There are a number of deputy directors under him, each incharge of a department. The different departments are Public Health, Medical, Professional Education and Research, Control of Communicable Diseases, Maternity and Child Welfare, Family Planning, School Health, Drug Control and Nursing.

At the District Level

At the district level, the Chief Medical Officer is incharge of both the Medical and Public Health Departments. Under him there are two Deputy Chief Medical Officers, one incharge of Medical and the other incharge of the Public Health Department.

The district has a General Headquarters Hospital under the charge of a Senior Medical Officer or Superintendent. He has a Resident Medical Officer under him. Then there are Assistant Medical Officers looking after various specialized fields like Laboratory, blood transfusion, X-Ray, Operation Theatre, Pathology, etc. They are helped by the Nursing Staff under the charge of a Matron.

In the rural areas each block of villages has a *Primary Health Centre.* This is the last link in the Public Health Organization in the periphery. The Health Centre provide and develops the following health services in the rural areas. All these services are given free.

(1) Medical relief through the curative Medical services both for out-door and indoor patients.

(2) Maternity and child health services including family planning, training of dais, free milk programme etc. These services are provided in the homes of the patients although there are four beds in the Centre for maternity cases.

(3) Control of an immunization against communicable diseases specially smallpox, tuberculosis, tetanus, cholera, etc.

(4) Rural sanitation and hygiene with emphasis on popularisation of sanitary latrines, composting of refuse, soakage pits, etc.

(5) Provision of safe drinking water.

(6) School health service by providing periodical check up, follow up and correction of defects, and school nutrition programme.

(7) Improvement in vital statistics *i.e.*, the birth and death records and correct reporting of other vital events such as occurrence of various communicable diseases. Correct and complete vital statistics are a must for planning health programmes.

(8) Health education of the public to ensure active co-operation of the

people inpreventing disease and promoting health.

Each Primary Health Centre has the following staff attached to it: a male and a female doctor, sanitary inspectors, health visitors, vaccinators midwives and compounders. Each centre has its own dispensary Each centre has three sub-centres in a block There are 5000 blocks in India. Each block consists of 1000 villages with a population of about 66,000 people. Since the beginning of the Third Plan the primary health centres are also looking after the family planning programme and the operations of the national programmes of eradication of malaria and smallpox.

Role of the Individual

It is the duty of each individual to keep himself or herself in a state of good health He should also keep his own home and surroundings clean. He should notify all cases of infectious diseases in his family to the local health authorities. He should get himself and members of his family immunized against the preventible diseases in order to protect his family and prevent the spread of the disease in the community.

He should act as a responsible citizen and do his best to promote good health in his family and community

Role of the Community

The community also has an important role to play in the maintenance and promotion of health amongst its members. Self-help is the best help and a large number of useful health programmes can be organized at the Community level without waiting for help from the government These programmes can include improved sanitation, cleaning of drains, prevention of breeding of mosquitoes and house-flies, inspection of food articles sold to the public, keeping the environment clean ; organizing games and recreational activities for the children, adolescents and adults, arranging lectures and talks by specialists on topics pertaining to health and disease ; screening of films on health etc.

All these measures will increase the involvement of the people with matters of health and would go a long way towards improving the general health and awareness of the community.

Voluntary Agencies working in the field of health

(1) Bharat Sevak Samaj. One of the prime objectives of Bharat Sevak Samaj (BSS) is to help people to achieve health by their own actions and efforts. The BSS has its branches in all the States and in nearly all District headquarters. It works through these branches and holds work camps So far it has conducted more than 5000 village work camps attended by 2,00,000 campers (students and youth). It has also conducted urban camps in all the important towns of India. These camps have made the people health conscious and helped them to avail of the facilities provided by the Government local bodies and private institutions The BSS has also been helping

in the control of diseases and in promoting sanitation by making people actively participate in the planned National Health programmes of the Government in the spirit of co-operative community service.

2. The Indian Red Cross. The Indian Red Cross has made a singnificant contribution towards the welfare of the nation It has a net-work of over 400 State and District branches all over India, and has been executing programmes for the promotion of health, prevention of disease and mitigation of suffering among the people.

With the acceptance by the Government of the concept of a welfare State, health and welfare services have greatly improved in the country in recent years. But no services can succeed without voluntary effort on the part of the people. The Red Cross plays a vital part in infusing this spirit in the community. Amongst the activities undertaken by the Red Cross the following are note-worthy.

(1) Relief-work in times of disasters like floods, drought, earthquakes etc. This includes supply of food grains, vitamin tablets and capsules, anti-malaria and sulpha drugs, antibiotics, codliver oil capsules, blankets, cloth and garments to relieve the suffering of the victims.

(2) The care of the sick and the wounded among members of the armed forces constitutes one of the primary obligations of the Red Cross. It also takes care of the sick and disabled ex-service men.

(3) Maternal and Child Welfare. The Indian Red Cross has done pioneering work in promoting maternal and child welfare services since its formation 40 years ago.

(4) The Junior Red Cross is the children's branch of the Red Cross and functions in schools. Its aims are promotion of health, service to others and fostering of world friendship.

(5) Family Planning Programme. The Indian Red Cross has also undertaken a family planning programme and some of the state branches are running a number of Family Planning Centres.

(6) Blood Bank and First Aid. The State branches of Bombay, Madras and Punjab run blood banks on a small scale. The Orissa branch has also established one recently. The Society is now planning to start a full-fledged bank in Delhi.

The St. John Ambulance Association in India functions as the ambulance wing of the Red Cross. It has so far trained over 20,89,000 men and women in First Aid, Home Nursing and allied subjects. The trainees form themselves into uniformed Brigade members who render first aid to the sick and injured at congregations such as fairs, festival, sports, meetings etc.

3. The Hind Kusht Niwaran Sangh. The Hind Kusht Niwaran Sangh (Indian Leprosy Association) was formed in 1950 taking over the assets and liabilities of the British Empire Leprosy Relief Association (Indian Council).

The Sangh organizes All-India Leprosy Workers Conferences. It also conducts research work on leprosy at the School of Tropical Medicine in Calcutta with the co-operation of the Endowment Fund of the School and the Indian Council of Medical Research.

The investigations in this department have been very helpful in determining the benefits and limitations of the sulphone treatment. A number of trials on alternative drugs have also been made. Research has also been conducted on various aspects of bacteriology, histopathology and immunology.

Health Eduction and publication of books, pamphlets, posters, etc., on leprosy is another important activity of the Sangh.

It also trains doctors to become specialists in leprosy control and treatment.

4. Indian Council for Child Welfare. (I.C.C.W.) The Indian Council for Child Welfare (I.C.C.W.) was established in 1952. It believes that the child is a part of the economic plan and that the welfare of children is an investment for the future. One of the most important of its tasks, therefore, has been to create and develop a consciousness in the minds of both Government and the general public about the need for an integrated child welfare programme.

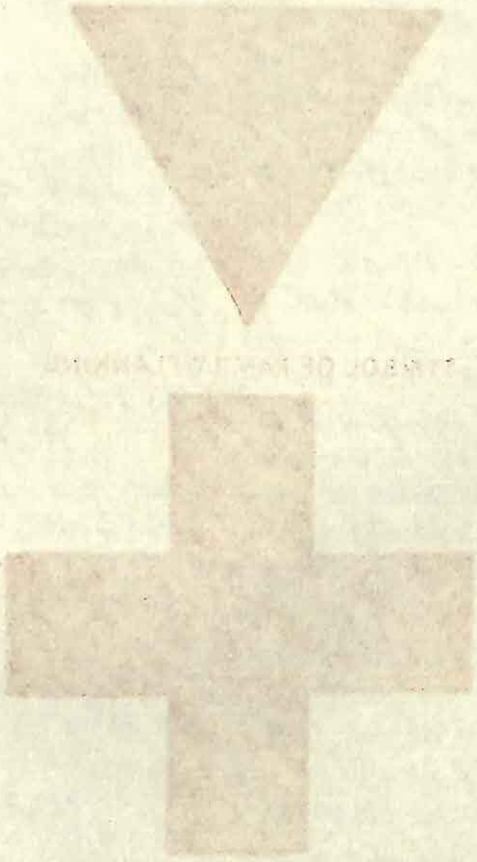
Its task is enormous because of the fact that children under 16 years of age constitute almost 40% of India's population.

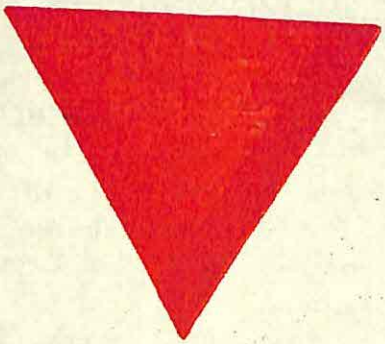
The Council has agitated for reforms in legislation affecting children an dintegrating and improving the standards of the services meant for them. It has stressed the urgency of different problems through its annual meetings, conferences, seminars at official meetings and from public platforms and on occasions like the Children's Day.

It has also started either by own efforts or through its State Councils, various types of services and pilot projects for children thus widening the field of child welfare.

5. The Indian Medical Association is a registered body of qualified practitioners in India, trained in modern scientific medicine. This association has done a lot towards focussing the attention of the government on problems of national health. In 1938 it recommended at its Annual Conference that the Central and all State Governments should allocate a minimum of 15% of their annual revenue for the purpose of medical relief and public health. At its annual conference in 1941, the I.M.A. drew the attention of the government to the poor standards of health and physique in the country due to inadequate nutrition.

Further as a result of a demand, from the I M.A., the Government of India appointed a Health Survey and





SYMBOL OF FAMILY PLANNING

SYMBOL OF RED CROSS

Development Committee in 1943-44. This was called the Bose Committee and its report was published in 1946.

The I.M.A. has also been responsible for the implementation of the Employees' State Insurance Scheme, for ensuring better standards of medical education, for laying emphasis on the urgency of making India self-sufficient in drugs, surgical and medical appliances etc.

6. Tuberculosis Association of India. This association offers expert advice and serves as a co-ordinating agency in standardising methods, promoting consultations and conferences, starting model institutions training tuberculosis workers, carrying out heath education etc.

It also organizes the Tuberculosis Seal Sale campaign since 1950.

It also has three institutions under its control These are the Lady Linlithgow Sanatorium, the Tuberculosis Hospital at Mehrauli and the New Delhi Tuberculosis Centre.

7. The Kasturba Memorial Fund. This fund was created in commemoration of Kasturba Gandhi after her death in 1944. The fund was raised with the main object of improving the lot of Indian women specially in villages, through gram sevikas.

Different training campaigns are organised and training is given in first-aid, home nursing, child welfare, health visits, rural sanitation, balanced diet and cheap indigenous remedies. The Trust has nearly a crore of ruppees and is actively engaged in various projects in the country. The organization has branches in all the States of India except Jammu and Kashmir. Each State branch runs a training centre for Gram-Sevikas as well as several Balwadis, Arogya Kendras, hospitals and other incidental and allied activities in many villages.

The Trust conducts and promotes charitable activities for the general welfare of mothers and children in rural areas of the country. It imparts mid wifery training, and also carries on anti-leprosy work in Arcot District of South India.

8. Family Planning Association of India. The first All-India Conference on Family Planning was held in Bombay in December 1951. The Conference was attended by over 100 doctors and social workers. The Conference stressed the importance of family planning as a health measure as well as to influence population trends.

The Association started its own model clinic in Bombay in September 1952. Since then it has developed the clinic as its main birth control centre with six branches.

The Association has also trained several hundred doctors, health visitors and social workers.

The Headquarters of the Association has been instrumental in carrying out widespread education work in family planning through film shows and by the publication of educational

material in the form of pamphlets, periodicals etc., like planned Parenthood – the Journal of Family Welfare.

The Association also supplies approved contraceptives at clinical rates to welfare clinics.

9. The All-India Blind Relief Society. The All-India Blind Relief Society was established in 1946 with a view to co-ordinating different institutions working for the blind. It organizes measures for the relief of the blind through health education and eye relief camps.

It gives relief to about 60,000 eye patients every year. For funds it depends on Government grants-in-aid, donations and treatment fees.

Summary

The standard of Public Health depends upon various factors such as the individual, the community and the resources of the state for the protection, preservation and promotion of health.

At the national level, that is in the Central Government the Health Minister is in charge of the Ministry of Health and Family Planning. He is assisted by a Health Council, members of Parliament and a number of other officials in charge of various departments like medical, Public Health, Family Planning, etc. The centre's responsibility is limited to matters relating to International health, port regulations, quarantine, drug standards, vital statistics, state programmes, etc. The centre also gives technical advice and financial assistance to states for promotion of health. However, the policy matters are laid out by the centre to be implemented by the states.

In the states the set up is more or less on the same lines as at the centre. There is a state Health Minister assisted by a number of senior officials and others attached to various departments.

As for the District Organisation, the Chief Medical Officer is over all incharge of both Medical and Public Health Departments. These deparments have to undertake the task of looking after the health problems of both the urban and rural population in connection with the Medical relief, Maternity and Child Welfare Immunisation, Education Sanitation and Vital Statistics. The Implementation of these is helped by the various social organisations in the country such as the Bharat Sevak Samaj, the Indian Red Cross Society, Hind Kusht Nivaran Sangh, the Indian Council of Child Welfare, the Indian Medical Association, the Tuberculosis Association of India, the Family Planning Association of India, the Kasturba Memorial Fund and the All-India Blind Relief Society. It is the duty of the individual and the community to help in the promotion of good health for a healthy nation means a strong nation.

I. Essay Type and Short Answer Questions

1. What is the role of the centre in the promotion of good health ?

2. What are the standards of Public health ?

3. Mention the part played by the State in health organisation.

4. Write about the work done by any two social organisations in this country to promote good health.

Find out the correct answer in the following statements :

(*a*) A doctor visiting a sick man found that he was suffering from cholera. Having treated his patient, the doctor, as required by law, informed the local Health Officer

because:

(1) He thought the man might die ;

(2) The Health Officer would be able to take steps to prevent the disease from spreading :

(3) The Health Officer would have the responsibility of the patient and not the doctor.

Which *one* is *best* reason ? (1), (2) or (3)

(*b*) It is important that all school children should be inspected regularly by medical officers because :

(1) The Headmaster must keep a record of heights and weights of all children in his school.

(2) It is possible to detect any health defects at an early stage and have them corrected.

(3) It is part of the health authorities plan to prevent the spread of diseases.

(4) It helps mothers as they do not have to take their children to the Doctor so often.

Which *one* is the *best* reason ?

(1), (2), (3) or (4)

(*c*) A clinic is a place where people can attend a doctor, usually a Government doctor and without expense, to receive treatment and medicine. The clinic does not provide beds as a hospital does. There are usually more clinics in one area than hospitals because :

(1) Most people attending a doctor have a minor illness and do not need to go to hospital, as suitable medicine will cure their illness.

(2) Hospitals cost a lot of money so clinics are built instead of hospitals.

(3) A lot of people prefer to go to a clinic and not a hospital.

Which *one* is the *best* reason ?

(1), (2) or (3)

Activities

1. List out the various activities of the Indian Red Cross Society.

2. Make posters of the following :

(*a*) A donor donating blood for the Blood Bank.

(*b*) For Blind Relief.

(*c*) Eradication of Tuberculosis.

"A stitch in time saves nine".
—A Proverb

Safety, First-Aid, Home Nursing and Civil Defence

CHAPTER 20

Safety Measures

These mainly deal with the day to day pattern of safe behaviour in the home, school and the community. Hence knowledge of safety rules is not enough but one should use this knowledge to develop safety habits. One should practise safety rules not only for his protection but also for the protection of others.

Accidents do not just happen. They are caused by many factors that can be prevented. Lack of knowledge, thoughtlessness, indifference, carelessness, taking risks, fatigue, haste are some of the causes. Hence safety begins with an individual. How a person feels and acts makes a difference during an accident. An alert person can prevent an accident whilst an indifferent and tired person cannot avoid it. Therefore, every one of us need to take time, make an effort and develop alertness in reducing the danger of accidents.

HAZARDS AND PREVENTIVE MEASURES

I. Fire Hazards and Their Prevention

Fires can cause damage to life and property. Fires are mostly caused by carelessness. People are in a hurry and neglect to take necessary precautions for prevention of fires.

Fig. 20.1

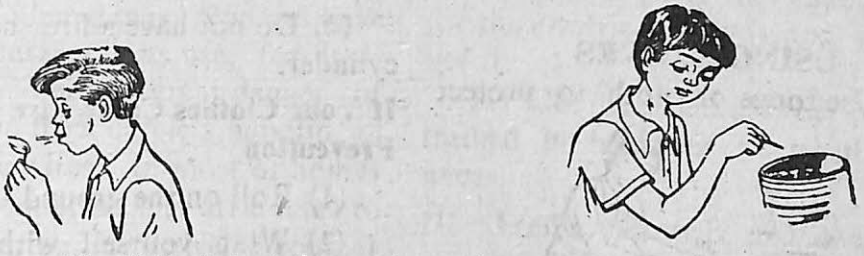


Fig. 20.2—Put out the match completely before you throw it.

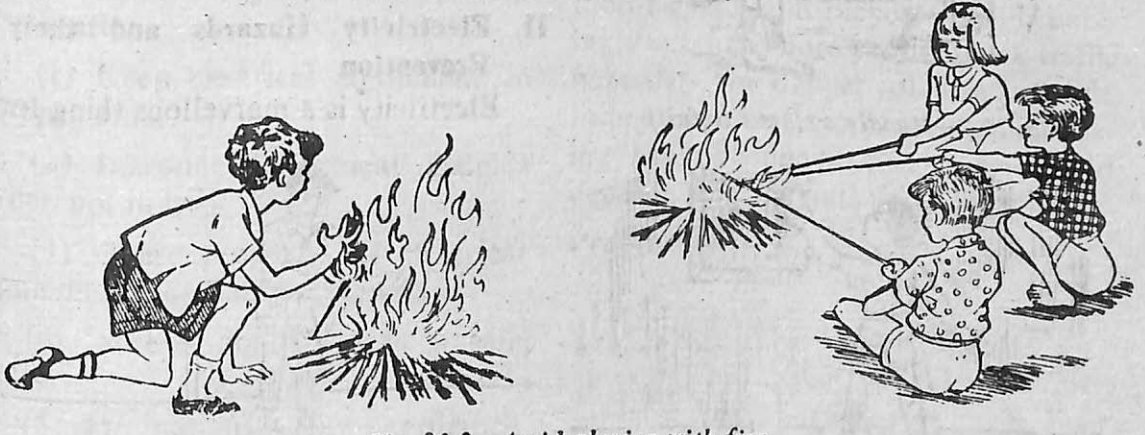


Fig. 20.3—Avoid playing with fire

Prevention

(1) Keep matches in a closed box away from heat.

(2) Make sure that used matches are properly put out before throwing them away.

(3) Keep matches away from children.

(4) Always have water or sand at hand when making a fire.

(5) Be careful not to burn paper or leaves out of a doors on a windy day.

(6) All open fires should be

properly guarded.

(7) Keep petrol or spirit away from fires.

(8) Keep curtains or clothing away from fires.

(9) Children should play with fireworks only if adults are with them.

(10) During summer, when it is dry, a fire can spread very easily. So special precautions should be taken.

(11) Keep burning oil lamps at a safe distance from combustible materials.

USING STOVES

(1) Use tongs or cloth to protect the hands when working on stoves and hot utensils.

Fig. 20.4—Handle a stove carefully

(2) Handle a kerosene-oil stove carefully.

Using Gas

(1) Use tongs or cloth to protect the hands when working on a gas stove.

(2) See that the gas stove is properly put out after use.

(3) In case of leakage immediate steps should be taken to stop it.

(4) Do not have a fire near a gas cylinder.

If Your Clothes Catch Fire
Prevention

(1) Roll on the ground.

(2) Wrap yourself with a heavy blanket, coat, carpet or a durri.

(3) Do not run.

II. Electricity Hazards and their Prevention

Electricity is a marvellous thing for

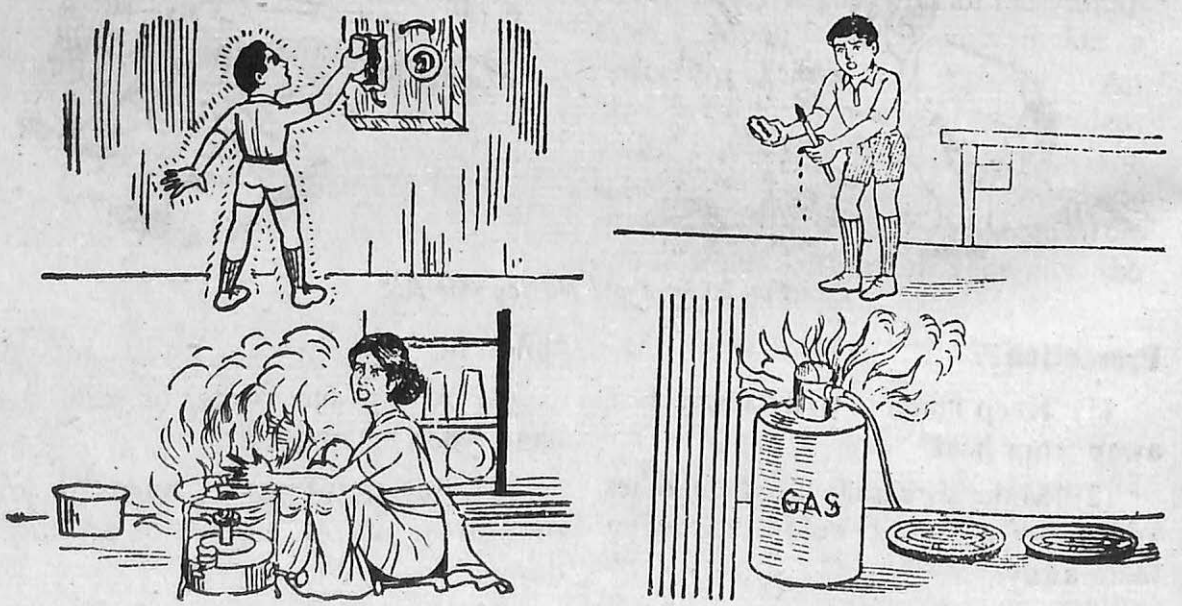


Fig. 20 5—Discuss the hazards involved in above diagrams and how to prevent them.

it gives us so many comforts. It gives us light, heat, helps to cook food and

Fig. 20.6—Handle Electric equipment with proper care

does many other things. But we have to be very careful in its use, for it is very strong. There is great danger of *electrocution* from careless handling of live, electric wires. In most of homes accidents from electricity arise due to defective wiring, defective electrical appliances or gadgets and from improper use of electrical equipment.

Prevention

(1) Keep electrical equipment in proper order.

(2) Disconnect electrical gadgets when not in use.

(3) Guard properly all electrical appliances from children.

(4) Store all appliances in a safe place.

(5) Do not use any appliance which does not have a plug at the end of the cord.

(6) Handle electric cord carefully ; do not twist or bend them or step on them. Keep them away from water.

(7) Never use an electric appliance whilst standing in water or with barefeet on the floor.

(8) Never touch electrical equipment with wet hands.

(9) Stand on a wooden seat or use rubber footwear whilst switching the light on and off.

(10) Broken electric wires after storms etc., can be very dangerous. Stay away from them until the current is switched off or disconnected and call for help.

(11) Learn where the main switch for the electric supply is and how to use it.

(12) Children should be properly trained in handling electrical appliances.

III. Traffic Hazards and their prevention

Today cars, trucks, buses, scooters, motor-cycles and bicycles are becoming more and more problems of traffic hazards. The danger of loss of life, injury from traffic accidents is increasing rapidly, hence everyone should develop safety habits and attitudes.

Prevention

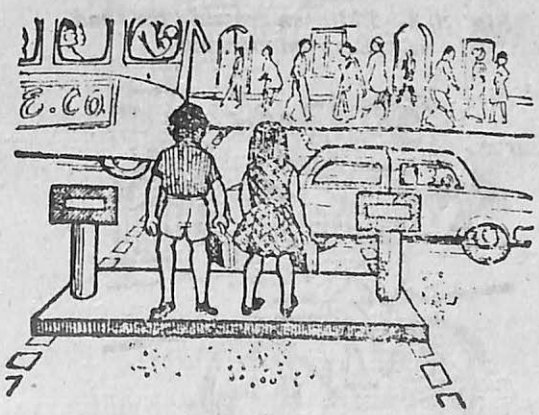


Fig. 20.7—Children Waiting for the Signal to Cross

(1) Be alert at all times.

(2) Become familiar with and obey :

(3) **When on foot :**

(1) Walk on the left side of the road and footpath if available.

(2) Walk in single file (if in group) and be constantly alert.

(3) Look on both sides of the road, wait till the way is clear and then cross straight over.

(4) When available always use the pedestrian crossing.

(5) Cross on a green light or when the traffic policeman gives an all-clear signal.

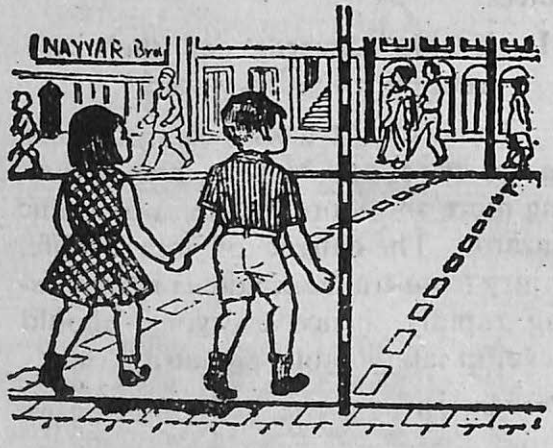


Fig. 20.8—Children crossing the road at pedestrian crossing

Fig. 20.9—Trick cycling is hazardous.

(6) Stop on a red light or when the traffic policeman gives the stop-signal.

(7) Wear white clothing at night or carry a torch or lantern.

(8) Do not play on the road or in the street.

(9) Do not run from the back of parked vehicles.

(10) Do not run on the road to chase a ball or a kite or anything else.

(11) Do not stand in the middle of the road to talk to some one.

(12) Watch out for approaching vehicles and give them enough time to stop especially on a wet road.

4. **When on a Cycle :**

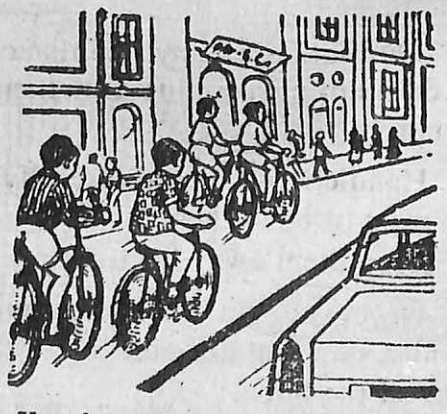
(1) Obey all traffic signals.

(2) Avoid carrying someone else on a bicycle.

(3) Hold the handle bar firmly with both hands.

(4) Never hold into another moving vehicle or another cyclist.

(5) Be careful when passing parked cars.



Use the track provided for cyclists.

(6) Use a basket for carrying packages, never carry articles in the hands for they must be free to hold the handle bars.

(7) Ride straight and avoid overtaking.

(8) Always give proper hand signals for turning or stopping.

(9) Keep a safe distance from objects or persons whilst riding.

(10) Cycle only in a safe place.

(11) Avoid trick cycling on the road.

(12) Watch the movements of other cyclists, for their carelessness can cause injury.

(13) Always use a light or a torch when riding in the dark.

(14) Keep the cycle in a safe place when not in use or lock it for safety.

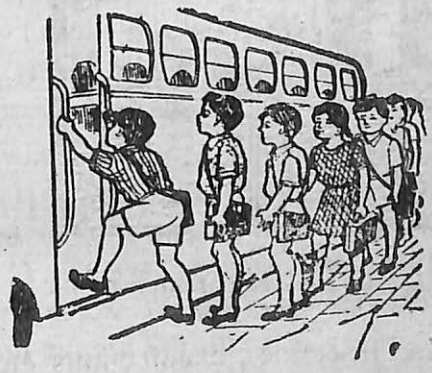


Fig. 20.10-Always form a queue.

5. **Boarding Transport.** Accidents do occur to a passenger in a motor-car, a bus or an animal-driven vehicle. There are certain safety rules an individual should observe in this connection.

(1) Get in and out of a vehicle only after it comes to a dead stop and when it is at the regular stopping place.

(2) Use the safety bars whilst getting on or off a bus.

(3) Stay away from moving vehicles.

(4) Never chase a moving vehicle.

(5) Get off the vehicle on the left side of the road to avoid getting in the way of other moving vehicles.

(6) Never tamper with the moving parts of a vehicle.

(7) Do not disturb the driver of a moving vehicle.

(8) Do not lean out of a moving vehicle or put out of it any part of the body.

(9) Hold firmly on to the strap if there is no place to sit in a moving bus.

(10) Enter and leave the bus quietly and in single file.

(11) Respect the authority of the

Fig. 20.11—Is it safe to move out of the bus, while it is moving ?

conductor and the driver whilst you are in a bus.

IV. Hazards of Swimming.

In India a large number of children die through drowning. The victim of drowning dies as a result of getting choked. This is due to water entering into air passages.

Prevention

(1) Do not run on the wet surface near a pool or tank.

(2) A person should stay out of water unless the depth and the force of the water is known.

(3) Every person should learn to swim, hence swimming should form a part of the school curriculum.

(4) Swim only where there is some one else swimming or watching.

(5) Avoid swimming immediatly after meals.

(6) Avoid strong currents whilst swimming in a river or sea.

(7) Young children should be taught to stay away from the edge of a river and to never push others into the water.

(8) In shark-infested seas obey the warning notices put up or in areas where dangerous currents occur.

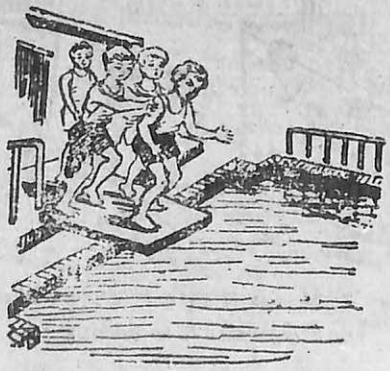


Fig. 20.12.—Pushing is a bad habit.

V. Hazards of Poisoning

Poisoning is an important cause of accidental death. These accidents occur as a result of carelessness on our part. Hence strict safety measures should be taken to prevent such hazards amongst children.

Prevention

(1) Keep all medicines, household cleaners, insectides, disinfectants etc., well out of the reach of children.

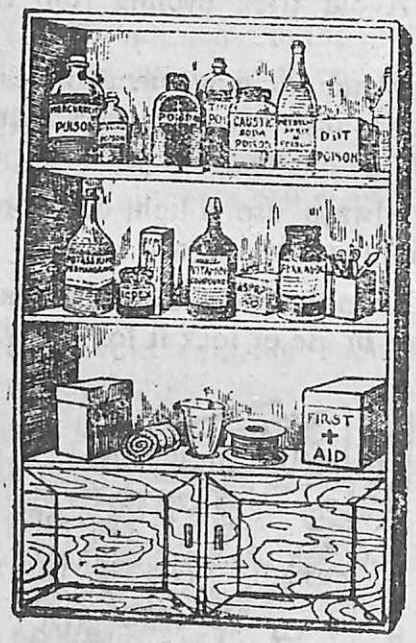


Fig. 20.13.—Keep Medicine in a safe place

(2) Keep all bottles labelled. The bottles containing poisons should be labelled in *Red Ink* or with *Large letters.*

(3) Read the label carefully when giving or taking a medicine.

(4) Keep poisonous drugs *away* from other medicines preferably under lock and key. When their purpose is served throw them away.

(5) The key of the poison cupboard should be kept only by a reliable person.

(6) Dispose off promptly the unused prescription drugs.

(7) Drugs should be poured from the opposite side of the label in order to prevent it being disfigured.

(8) When indicated on the label keep the medicine in a cool place.

(9) Any medicine with its expiry date being over should not be used.

(10) Older children should be taught the hazards of poisons.

VI. Hazards of working in Laboratories

This is a place where hazards in different forms may occur. The danger may be due to chemicals, fire, animals, etc. Hence precautions should be taken to prevent accidents.

Prevention

(1) Never try any secret experiment such as mixing liquids for fun.

(2) Always experiment with a purpose. Do not start an experiment if you cannot complete it.

(3) Label everything in the laboratory such as containers, cupboards, boxes, bottles, etc., for this will save the working time daily.

(4) Never work with all the doors and windows closed.

(5) All inflammable articles like alcohol, ether, plastic and synthetic articles should be kept away from the flame.

(6) When diluting acids, add the acid drop by drop into the water. Do not add water directly to it.

(7) Do not inhale the fumes from chemicals like strong acids, ether, chloroform, etc.

(8) Avoid drinking water in the laboratory glassware.

(9) Wash your hands before you eat after doing laboratory work.

(10) Do not be tempted to taste things in the labortory.

(11) Laboratory tables should be kept neat, clean and tidy.

(12) It is hygenic to dip your hands into a dilute solution of any disinfectant like Lysol after washing first with soap and water at the end of your laboratory work.

(7) **Hazards of Animal Bites.** There are many types of animals whose bites can be fatal. Even a small insect like a wasp can cause intense discomfort. A poisonous snake, or a rabid dog may prove hazardous to health and hence safety measures should be taken to avoid danger to life.

SNAKE HUZARDS

There are many snakes in the country. Many types are poisonous. When a snake bites, the poison from its poison gland is injected through a pair of biting fangs into the human body. A bite by a poisonous snake can endanger the life of a person.

Prevention

(1) It is best to be alert at all times.

(2) Use a torch light and stick whilst moving in a dark place.

(3) Be careful whilst moving where there is thick vegetation.

When the Animal like a Dog is Rabid

A rabid dog bite is common among children. The danger lies not in the wound itself but in the Saliva which contains the bacteria. These enter into the wound and produce a serious illness called Rabies.

Prevention

(1) Children should be kept away from stray dogs or strange dogs.

(2) Every dog owner should provide a leather strap around the neck of his pet dog for identification. Pet dogs should be regularly vaccinated against rabies.

(3) All stray or mongrel dogs should be destroyed.

VIII. Hazards of Practising Crafts

The use of certain tools involves hazards and safety measure should be undertaken to prevent accidents and mishaps.

Prevention

(1) Do not play with tools like knives, scissors, tongs, hammers, garden tools but use them only for the intended purpose.

(2) Be very careful whilst using sharp tools like a knife, fork, etc. They should be kept sharp for dull tools slip more easily.

(3) Heavy tools like a hammer or machinery should be used with care and stored in a safe place.

(4) All tools should be kept in good repair.

(5) It is better to use tools required for craft under the supervision of the teacher. He should first tell how dangerous they can be if they are misused and warn accordingly.

IX. Hazards of Climbing Stairs

The home should be the place to teach safety to a child. Many are killed in home accidents caused by falls. These may be caused at various spots and one such accident could be from climbing stairs.

Prevention

(1) Always watch your step whilst climbing up.

(2) Stairs should be walked up and down slowly with feet firmly planted on each step and the hand rail used.

(3) Do not rush up and down the stairs or you can be thrown off balance. It is a better for an adult to pause on the landing whilst climbing.

(4) Stair lighting should be controlled from both top and bottom.

(5) It is best to climb up the stairs towards the left side and come down stairs towards the right side.

(6) Do not leave any objects like oil, grease or water in the middle of the stairs. These obstruct the climber and may cause a fall.

Fig. 20.14—Concentrate while working with tools

X. Hazards of Playing

Use of the playground and playfield becomes the centre of accidents

Fig 20.15—Animals should not be teased

with children. Parents and teachers have a responsibility to have safe areas for playing.

Prevention

(1) The playground area should be in clear view of the road or house from any direction.

(2) A playing area should not be near railroads, industries, etc.

(3) The exit and entrance areas in school playing grounds should be clearly located to minimise congestion and its associated dangers.

(4) Rules for the use of the games apparatus should be understood.

(5) Supervision by teachers during game is very essential.

(6) Certain equipment should be handled according to the age of children like the discus, javelin for senior children.

(7) Try to play safe games without pushing and rough play.

(8) Do not throw sand balls or sand on each other.

(9) Keep away from stray dogs whilst playing.

(10) Avoid teasing and irritating animals.

(11) Avoid playing a game recklessly. Play the game like a true sportsman even if you know that you are losing it !

Summary

The process of learning starts very early in life. Every child learns to sit, stand, walk, run and play. These skills are learnt at home and later at school. Games are played. But in this process of learning these physical skills, a child may get hurt, suffer injuries and even dangerous mishaps. This can happen continuously as the child is growing and learning new skills, finally to become an adult. Even an adult does not escape certain hazards in life like fire, drowning, etc. Therefore, it is essential that everyone has to have a knowledge of safety measures to guard against different types of hazards in our everyday life. This will prevent the occurrence of common accidents, A knowledge of safety measures ensures not only personal safety but also a social responsibility.

I. Essay Type and Short Answer Questions

Discussion Questions

1. A burnt child dreads the fire.
2. A stitch in time saves nine.
3. Prevention is better than cure.
4. Safety measures help to avoid hazards in life.
5. It is better to take your time than risk your life.
6. A true sportsman should always learn to play the game in the spirit of game.

II. Objective Type Questions

(*a*) Complete the following outline on the causes of *accidents* by writing either one or two words in each blank space :

Accidents do not just happen. They are caused.....factors, which can be eliminated or..... Lack of knowledge, thoughtlessness, haste, taking risks and.....are some of the causes. Safety begins with an..... .....One can develop an alertness to dangers and.....wherever you are. Every preson needs to take the time, make an effort to reduce the.....of accidents. Teachers should recognise this and whenever possible try to eliminate accident hazards in..... They also have the responsibility for preparing students to prevent.....in their school. Parents have this responsibility at..... In this way every one can follow safety..... against hazards in life.

(*b*) (1) Why should one practise safety rules ? (2 lines)

(2) What will you do if your clothes catch fire ? (3 lines)

(3) Mention two reasons of electricity hazards at home. (2 lines)

(4) How can dog-bite hazards be prevented. (3 lines)

Activities

1. Write out a simple experiment to prove that shutting out air-supply extinguishes a fire.
2. Find out about some hazards that are responsible for accidents at night.
3. Make posters of possible accident situations for persons walking, cycling or driving without a light at night.
4. Indicate by means of *two* illustrations how a scooter-driver can become accident prone.

CHAPTER 21

First-Aid and Home Nursing

"What men call accident is the doing of God's providence". Accidents often take place at home, in school or elsewhere. So everyone should know what to do in such cases. If proper help, is not given in time the patient's coudition can get worse or if care is not taken it may cause danger to life.

First Aid means the treatment given till proper medical aid comes. *The principles and practice of First Aid depends on practical medicine and surgery.*

(1) A first aider can give skilled help, prevent death, promote recovery and see that an injury or illness does not get worse until the doctor arrives.

(2) A first aider should use such materials that are at hand. It must be remembered that a first aider's duties stop as soon as the doctor comes on the scene.

(3) So the first aider does not take the doctor's place but only acts promptly.

(4) A first aider must also know one's limitation.

(5) When giving first aid the person should see if the patient is alive, unconscious or dead. If alive, the patient's breathing and pulse are the first things to be noted.

FIRST AID MEASURES

I. Serious emergencies

There are certain situations which are a matter of life and death. They are as follows.

(1) When breathing stops and if help is not given at once the patient will die.

(2) If there is severe bleeding and the bleeding is not stopped the patient will die.

(3) Suppose severe shock follows after an accident, unless suitable steps are taken to treat it, the patient will die.

It is very important that the first aider should master the treatment for the above situations.

II. Minor cuts, abrasions and bruises

(1) Apply a little tincture of Iodine or spirit if the wound is clean.

(2) Put a clean piece of gauze over it and then bandage or put a sticking plaster.

(3) Instead some cotton dipped in tincture benzoin may be put on the wound.

III. Extensive and deep cuts

(1) Cover the wound with a sterilised dressing and bandage.

(2) Send for the doctor.

IV. Dirty Wounds

(1) First cover the wound with a clean piece of gauze or cotton.

(2) Clean the area around the wound.

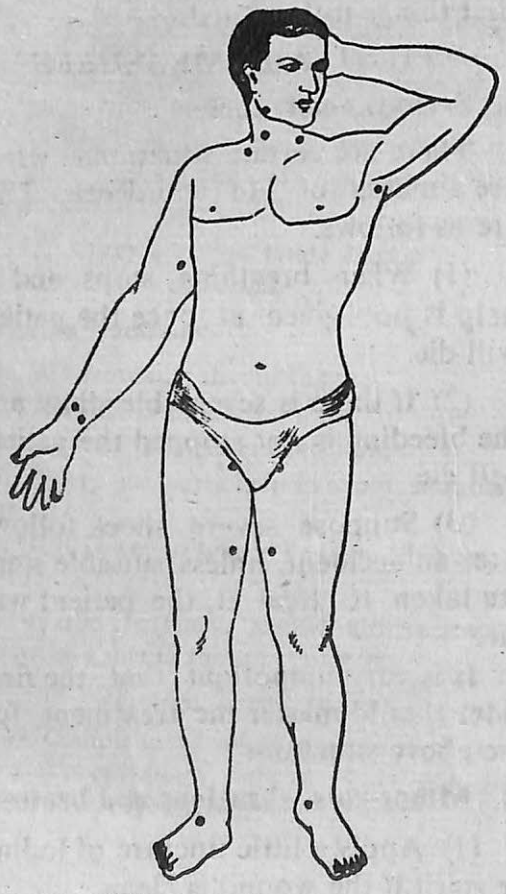


Fig. 21·1—Main Pressure Points to Stop Bleeding

(3) If it is a wound on the head, cut the hair around the wound if necessary.

(4) Wash the wound well with soap and water.

(5) Apply tincture of Iodine and cover it with gauze and bandage.

(6) In case of dirty wounds there is danger of tetanus, so the doctor should be consulted.

Bruises

(1) This can occur if a finger gets caught in a door. A person may get a black eye after a blow.

(2) Put cold water pads to the injury.

(3) If the injury is painful call a doctor.

DONOT

Any oinment or a wet dressing *should not* be put over a wound that is dirty.

The doctor should be consulted quickly if the wound is deep, dirty and is bleeding very badly.

VI. Bleeding

It is of three types :

(1) Capillary bleeding.

(2) Arterial bleeding.

(3) Venous bleeding.

Capillary Bleeding

(1) Blood is bright red and oozes out from the wound.

(2) To check bleeding, cover the wound with a clean piece of gauze and bandage tightly.

Arterial Bleeding

(1) Blood is bright red and comes out in jerks and spurts.

(2) To check bleeding put pressure with the thumb on the bleeding spot.

(3) If there are foreign bodies in wound, apply pressure on the upper part of the artery at a "pressure point" where there is a bone below.

(4) If the bleeding is severe send for the doctor at once.

(5) Do not give stimulants like tea or coffee till the bleeding stops. Water may be given instead.

Venous Bleeding

(1) Blood is dark red and flows in a steady stream.

(2) To stop bleeding raise the injured part above the level of the heart.

(3) Press on the part of the vein below the wound.

IV. Bleeding from the Nose can be due to an injury to the nose, or due to heat or congestion in the nose.

(1) Keep the patient before an open window for fresh air.

(2) Loosen all clothing round the neck and chest.

(3) Tilt the head backwards.

(4) Make the patient open the mouth for breathing instead of breathing through nose.

(5) Do not allow the nose to be blown.

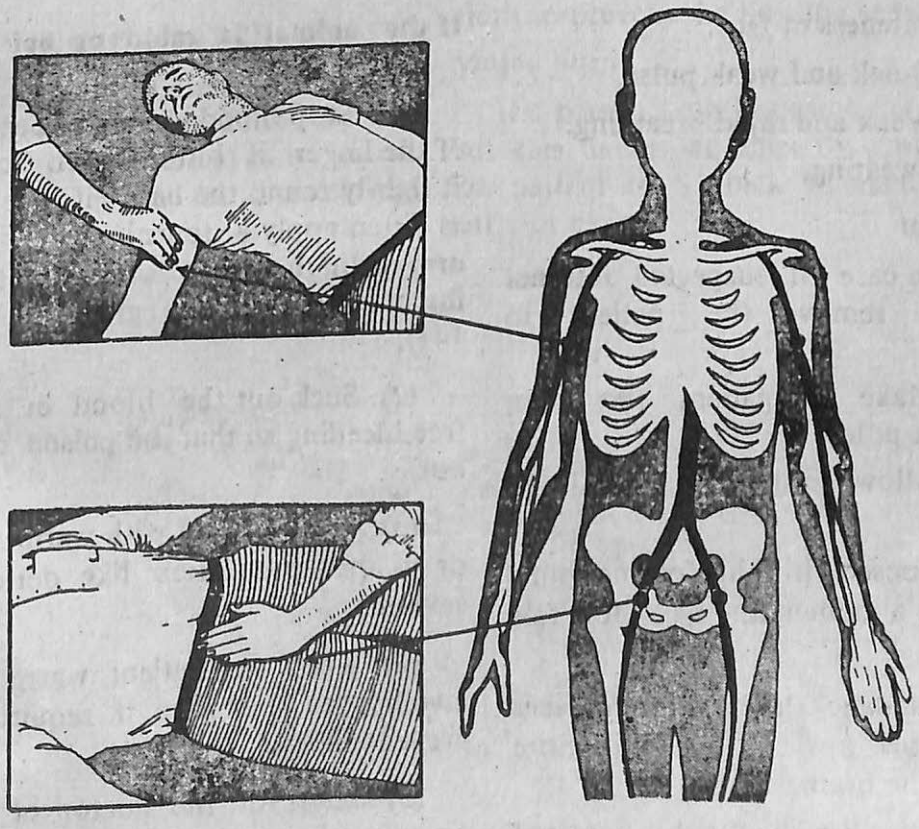


Fig. 21.2—Compressing an Artery to Stop Bleeding.

(6) Keep a pad dipped in cold water or an ice bag on the patient's nose, forehead and back of the neck.

(7) If bleeding does not stop, send for the doctor.

Internal Bleeding. This occurs when internal organs like the lungs, stomach spleen, intestines, etc., get injured.

Bleeding occurs in the cavities of these organs such as the chest or abdomen. Actual bleeding is not seen outside but from the signs and symptoms one can make out the type of bleeding.

Signs and Symptoms

(1) Paleness of face.

(2) Quick and weak pulse.

(3) Weak and rapid breathing.

(4) Sweating.

Treatment

(1) In case of suspected internal bleeding, remove the patient to hospital.

(2) Make the patient lie down without a pillow.

(3) Allow fresh air around the patient.

(4) Loosen all tight clothing round the chest, abdomen and waist for free breathing.

(5) Bandage the arms and legs from below upwards to send more blood to the brain.

(6) Consult a doctor for internal bleeding immedately.

DONOT

(1) Press over the wound with dirty hands.

(2) Press over the wound if there are foreign bodies in it.

(3) Delay to send for the doctor if bleeding is severe.

(4) Apply a tourniquet if you are not sure of its use.

ANIMAL BITES

If the animal is healthy

(1) Wash the wound with warm water or any antiseptic lotion like dettol or savlon.

(2) Bandage the wound.

If the animal is rabid or poisonous like a snake

(1) Stop blood circulation at once. If the finger is bitten catch hold of it tightly round the base ; if the limb is bitten apply a tourniquet to upper arm or thigh as the case may be (making of a tourniquet is given on page 141).

(2) Suck out the blood or allow free bleeding so that the poison comes out.

(3) Wash wound with warm water or an antiseptic lotion like dettol or savlon.

(4) Keep the patient warm and give hot tea or coffee if required to prevent shock.

(5) Send for the doctor at once or take the patient to the hospital for anti-rabies injection.

(6) The rabid animal should not be destroyed at once.

How to make a tourniquet

(1) Put a stone as big as a silver rupee or make a pad with any hard object.

(2) Put this in the middle of a folded handkerchief or a triangular bandage.

(3) Put the pad over the main artery.

(4) Tie the handkerchief loosely round the limb.

(5) Put a stick through the loop made and twist it till the bleeding stops.

INSECT BITES

(1) Remove the sting with disinfected needle or pin. (First hold the needle or pin for a second in a lighted candle or spirit-flame for disinfecting it.)

(2) Apply a weak solution of ammonia or soda bicarbonate or potassium permanganate.

(3) If there is severe swelling and general illness see the doctor at once.

BURNS

Minor Burns and Scalds

These occur due to touching a hot vessel, open fire, steam or spilling hot water or oil ; the part becomes red or blisters form. A burning sensation is caused.

(1) Apply oinment like burnol, savlon or cold cream or any greasy substance.

(2) Cover with a clean piece of cloth to prevent the burning sensation.

Major Burns

If a person's clothes catch fire, put out the flames at once by wrapping the patient in a thick blanket, rug, durri or carpet.

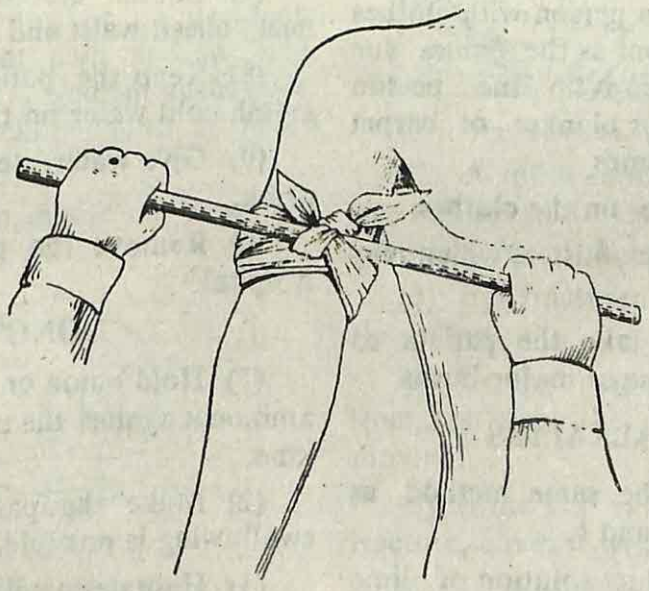


Fig. 21.3—A Tourniquet

(1) Do not burst the blisters.

(2) Put warm clothing on the patient.

(3) Give plenty of fluids like tea coffee to drink.

(4) Remove the patient to the hospital at once in a lying down condition.

CHEMICAL BURNS

(*a*) For Acids

(1) Remove the soiled clothing at once.

(2) Wash the burnt part well with plenty of water.

(3) Make a weak solution of Sodium bicarbonate (cooking soda, that is one teaspoon for 1/2 litre of water)—and go on pouring over the burnt part.

DONOT

(*b*) (1) Allow a person with clothes on fire to run about as the flames due to air rise. Wrap up the person quickly in a rug or blanket or carpet to put out the flames

(2) Pour water on the clothes.

(3) Break open blisters which may cause infection.

(4) Delay to take the patient to hospital in the case of major burns.

FOR ALKALIES

(1) Follow the same method as given above in *a* and *b*.

(2) Pour a dilute solution of lime juice or vinegar.

FAINTING SHOCK

Shock follows an injury, over work excessive heat, bleeding accident and bad news.

In this the blood pressure falls, the patient becomes pale. skin is cold, the pulse feeble and rapid.

(1) It requires intelligent and careful handling of patient

(2) Make the patient lie down in fresh air.

(3) Raise the legs except in cases of fracture so that the blood goes to brain or keep the patient flat with head low.

(4) If the patient is bleeding, stop the bleeding as early as possible.

(5) Any other injuries should be treated as well.

(6) Keep the patient cheerful and give crushed onion to smell.

(7) Loosen clothing round the neck, chest, waist and abdomen.

(8) Keep the patient warm and splash cold water on the face.

(9) Give water, tea or coffee to drink.

(10) Remove the patient to the hospital.

DONOT

(1) Hold onion or smelling salts or ammonia against the nose for a long time.

(2) Make the patient eat until swallowing is possible.

(3) Hesitate to call for a doctor if fainting is prolonged.

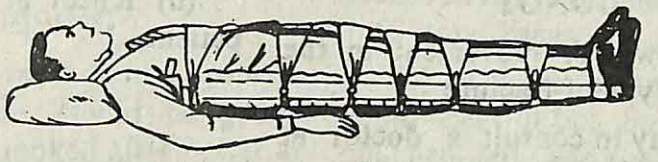


Fig. 21.4—Fracture of the Pelvis

Fig. 21.5—Fracture of the Thigh

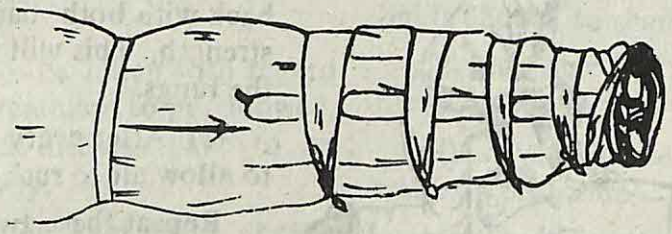
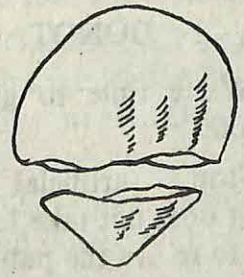


Fig. 21.6—Fracture of the Knee-Cap (i)

FRACTURES

These are caused when bones break due to a fall, blow or an accident. There is a great pain and swelling, and difficulty in movement at the spot. Sometimes a cracking sound is heard at the time of injury.

(1) A person should not be moved at all.



Fractures of the Knee Cap (ii)

Fracture of the Knee Cap (iii)

(2) A splint should be tied to the injured leg and this must be tied to the other leg at various points.

(3) For fractured arm or fore arm tie a sling.

(4) In the case of neck or back fractures keep the patient without moving.

(5) If the skin is broken over the fracture, cover it with gauze.

(6) Send for the doctor.

DONOT

(1) Allow any movement in the case of any type of fracture.

(2) Delay to consult a doctor at once.

DROWNING

(1) Clean the patient's mouth or throat of mud or any other thing that might have gone in it along with the water swallowed.

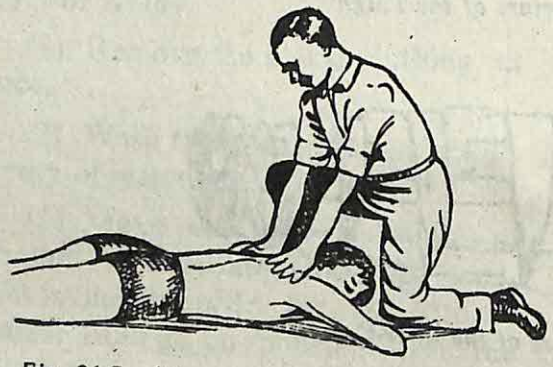


Fig. 21.7—1st movement "Count one-two"

(2) Put the patient with the back up and face on one side.

(3) Press on the back to bring out the water from the lungs.

(4) Start giving artificial respiration at once in the following way.

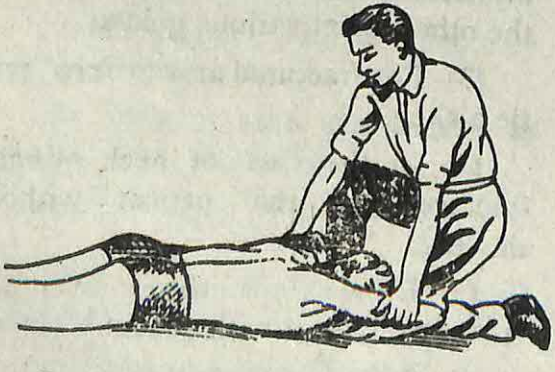


Fig. 21.8—2nd movement Count "Three"

(*a*) Kneel at the side of the patient.

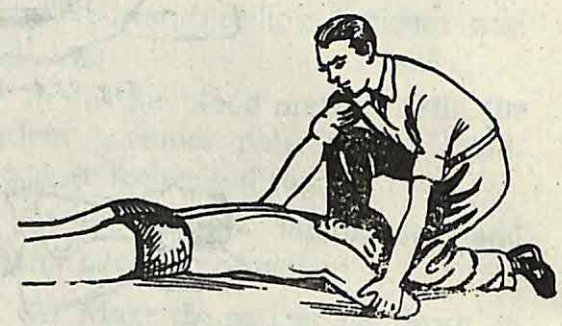


Fig. 21.9—3rd movement Count "Four-Five"

(*b*) Press on the lower side of the back with both hands with all your strength. This will force the air out of the lungs.

(*c*) After every two seconds stop to allow air to rush into the lungs.

Repeat these two movements 16 to 18 times a minute until the patient starts breathing.

(*e*) When artificial respiration is being given, the patient's wet clothes should be removed and dry clothes put instead.

(*e*) A hot water bottle may be given to keep the patient warm.

(*f*) Hot tea or coffee may be given as soon as the patient is able to swallow for stimulation.

DONOT

(1) Waste time to give artificial respiration.

(2) Stop artificial respiration because it does not take less than half an hour to revive the patient.

(3) Keep the clothing on.

PRINCIPLES OF HOME NURSING

These are the same as in a hospital. Good nursing care should be given. A patient can be looked after better at home, therefore, a patient will be happier and cheerful and make a speedy recovery. Moreover it is cheaper to look after a patient at home than in a nursing home or a hospital. This home nursing can be divided into three broad classes which are as follows :

(1) Care to be taken of the environment and personal cleanliness of the patient.

(2) Care to be taken with regard to the line of treatment to be followed, because different diseases have to be treated differently.

(3) Care to be taken with regard to the diet of the patient and the doctor's instructions in this respect must be strictly followed.

The Sick Room

The following details should be considered whilst making a room for a patient :

(1) It should face the south or south-west for sunlight and fresh air.

(2) It should be secluded with easy access to the bathroom and lavatory.

(3) There should be good ventilation with an inlet for fresh air and an outlet for foul air. Draughts must be avoided.

(4) The room should be clean, swept and dusted with a damp cloth daily.

(5) Rugs and carpets should be removed from the room in case of an infectious disease.

(6) A flower arrangement makes a room cheerful but the water should be changed daily and the flowers removed from the room at night.

(7) Rest and quiet are essential in a sick room. No one should disturb a patient at rest.

Making of the Bed in a Sick Room

(1) This bed should be placed so that the light falls on the patient from the side and not directly. Artificial lights should be shaded.

(2) A single bed is the best way to nurse a patient.

(3) It should be away from the walls on each side.

(4) The mattress should be of cotton with a loose washable cover.

(5) A mackintosh sheet should cover the mattress upto its total area.

(6) It should then be covered with a sheet and over this another mackintosh should be put with a draw sheet reaching from the shoulders of the patient to the knees. Whenever necessary this sheet can be drawn up and a fresh portion brought under the patient. If it is stained it can be replaced easily by a fresh sheet.

(7) A wool blanket should be put over in winter to give warmth with a minimum of weight.

(8) The pillows should be of cotton and should be below the head. A small pillow can be used for an aching back or limb.

(9) The quilt should be light and of washable material.

(10) The bedding should be kept clean and soiled articles should be put in cold water at once.

The Qualities of a Nurse

There are certain qualities in a nurse whether she is a trained or an amateur one when dealing with sick people. These qualities help one a lot. These are as follows :

(1) A patient, sympathetic, quiet and a cheerful manner.

(2) Good observation.

(3) Devotion to duty.

(4) Obedient to the doctor's orders.

(5) Personal cleanliness, good habits, firmness, neatness and punctuality are very essential.

Nursing Equipment

In order to look after the sick, the nursing equipment has to be considered and should be as follows :

(1) Two thermometers of different kinds, one to be hung on the wall above the patient's head for room temperature to be noted and the other being the clinical or doctor's thermometer for the patient's temperature.

(2) A hot water-bottle.

(3) An enema syringe or catheter and funnel.

(4) A bed pan and urinal.

(5) A graduated glass.

(6) A feeding cup.

(7) Two small open bowls.

(8) In long illness a bed rest is required.

(9) An air-ring cushion.

(10) An ice-bag.

(11) A jug and basin for the doctor's use.

(12) A disinfectant like lysol.

(13) Towels, bedsheets, pillow-cases, dusters, napkins, mackintoshes.

(14) Crockery and cutlery for the patient's use.

Taking of Temperature

The heat of the body is produced by the burning of food materials which takes place in actively working muscles and glands. Heat thus produced is distributed by the blood to all parts of the body. The surface of the body is generally cooler than the interior. During good health the body temperature is 98·4°F. If the temperature is higher or lower than this then it is said to abnormal.

The temperature is taken by means of the doctor's thermometer or a **Clinical Thermometer** placed either in the mouth, or the armpit or axilla.

Methods of Taking Temperature

I. In the Mouth

(1) Wash hands.

(2) Grasp thermometer firmly. Always handle end opposite the bulb.

(3) Shake the thermometer till the mercury comes down to 96.

(4) Place the bulb end in patient's mouth well under tongue, lips to be closed, for two to three minutes. Read the temperature and record it.

(5) Dip the thermometer in a

disinfectant and then wipe with cotton towards tip.

(6) Put the thermometer back into its container.

II. In the Axilla or Armpit

(1) The armpit should first be wiped dry.

(2) Insert the thermometer by pressing it tightly against the chest wall.

(3) Hold thus for five minutes.

(4) Read and record the temperature which is generally half degree lower than in the mouth.

Taking the Respiratory Rate

Respiration means the interchange of gases between the air and the circulating blood in the lungs.

The rate should be counted without the knowledge of the patient as this might lead to the control of the chest movements voluntarily then. The best way to do this is to note the rise and fall of the chest whilst taking pulse. The number of respirations may be counted for half a minute and doubled, but if it is irregular then the count should be for one minute.

The rates of respiration are as follows :

Normal adult rate=15 and 20 per minute with increase in rate during exercise and emotional upheaval.

New born baby=35 to 40 per minute.

A five years old child=25 per min.

The Pulse

This is the wave of expansion felt in the elastic arteries when the heart pumps blood into vessels that though always full yet can expand further.

The pulse can conveniently be felt wherever a superficial artery runs over a bone *e.g.*, Radial, Facial, Temporal and Tibial. The feel of the pulse should be first felt before the taking of the actual pulse rate.

The pulse is usually counted or taken at the wrist where the radial artery lies close under the skin on the thumb or outer side of the front of the arm The rates of pulse are as follows :

A new born =140 to 160 per min.
Children =80—90 per minute
Healthy Adult=72
Old age =60.

Summary

First Aid. It is the immediate attention given in an emergency situation till the arrival of a doctor. The first aider cannot take the place of a doctor unless he is a doctor himself. At any moment an accident can occur causing a possible danger to life. So steps should be taken to save the patient's life if a doctor cannot be found at once. Moreover prompt attention can relieve suffering and prevent any further damage to the patient *The first aider should give first aid, send for the doctor and tell in advance the nature of the case.*

Thus the doctor can come prepared and not waste further time.

Home Nursing consists of taking care of the patient at home. This makes the

patient happier to be in familiar surroundings and so makes a quick recovery. Care should be taken with regard to the room, bed, personal cleanliness, temperature of the patient. The line of treatment, food and diet must be strictly followed according to the doctor's instructions.

Discussion Questions

1. A few accidents occur in your school playground or in the gymnasium.

2. A good athelete does not have to consider safety.

3. It is safe to hitch rides and to carry some one on the handle bars of your bicycle if you are careful.

4. When a bus is coming, hurry on to it, because if you miss it, you will be late for school.

5. It is good to stand on the steps and entrance of a moving bus.

6. Girls should be made to stand in the school bus whilst boys sit down comfortably.

Things to do

(*a*) Make a first aid box for your home with a biscuit tin or sweets tin and put in it the following :

1. Cotton wool (a small role), some gauze, roller bandages (2·5 *cm* & 6 *cm* wide), sticking plaster, 50 *ml* tincture iodine, 50 *ml* tincture benzoine, 50 *ml* rectified spirit, 50 *ml* spirit ammonia aromatic, forceps, scissors, medicine glass, torch, baking soda (sodium bicarbonate), burnol or savlon, dettol, common salt, soap, a bottle of smelling salt, a clinical thermometer, Boric acid powder one ounce.

2. Make and carry out a plan to prevent accidents in school, on the way to school and at home.

3. Put up on the class bulletin board items on city accidents. Discuss ways in which these accidents could have been prevented.

4. Make posters showing safe ways of preventing accidents in school.

5. Write an article on ways of preventing accidents in school.

6. List out the ways in which your school prevents fires.

□

CHAPTER 22

Civil Defence

It is the duty of every citizen to take into account the intense dangers involved in modern warfare. Every individual should be familiar with the hazards that may occur after military operations. A large number of casualties may occur in any one place at any particular time. In such cases there may not be enough people, doctors and nurses to do the rescue work. So in order to meet such a situation and to be prepared to meet any eventuality, everyone possible should help in the home or elsewhere until organised assistance is available. Therefore civil defence is a citizen's job to plan and protect the life and property from enemy action.

In a total war the military operations, are carried out for defence or offence or for causing terror and immobilising the civil population. This may be done in the following ways :

1. **War Gases.** These gases such as Chlorine, Phosphine, Mustard gas, Nerve gas and Tear gas are irritable and poisonous. These cause irritation to the skin, eyes, nose, throat and lungs Civilians should be taught not to panic They should learn the use of gas masks and protective clothing. People should be provided with gas-alarm system like the Siren, Gas Proof shelters and decontamination equipment and trained they should be in the use of these.

2. **High Explosives.** These include Incendiary Bombs, Atom bombs etc. causing burns, wounds fractures and shock. First Aid training should be given to all.

3. **Nuclear Weapons** cause heat radiation, Gamma radiation and the blast. All these cause fires, radiation sickness, damage to buildings, fractures haemorrage, vomiting and shock. Training in the use of shelters should be given to all.

4. **Biological Warfare.** This means the use of viruses, bacteria and fungi to cause various diseases in man, and animals. In this the health authorities should take steps to control the spread of these diseases. Training of personnel in Home Nursing proves helpful in this type of warfare.

Civil defence is the job of the civilian population to provide

protection of life and property against enemy action. In this manner the civilian population has to be mobilised, organised and directed towards offering help and assistance so that the dangers in case of a total war are reduced to a minimum. Civil defence helps to boast up the shrinking morale of the public during an enemy attack. Moreover civil defences help to normalise essential services such as production, transport, medical facilities, communication and above all law and order.

Air Raid Warnings

An enemy plane is traced by means of the radar system. Immediately warning is given to the public to protect themselves from an air raid by means of the Siven system. One type gives the "Air-Raid Warning" and the other one the "Raider Passed". An enemy plane comes to attack or drop bombs, so the warning given lasts for two minutes with a wailing note. If the siren are not there whistles are used instead by blowing a short and long blast after at interval of 3 seconds as a warning. The "all clear" is sounded on the siren for 2 minutes steadily. The siren is located in central places like the police station, post office, factory etc. Home guards are trained to give warnings and all clear by means of whistles.

Black Out

The object of this is to confuse the enemy planes in locating places from air owing to the darkness at night. This is done by obcurving the light from doors and windows by painting the panes black or covering them with black paper. Lights in rooms must have black domes. In vehicles the lights should be painted black. It should be remembered that even a single light is dangerous for it can cause great disaster to a place in aerial warfare.

Trenches

Slit trenches about 8′ long, $2\frac{1}{2}$′ wide and 3′ to 4′ deep should be dug with no covers at top. A trench should be dug in such a way that it is within a distance of half the height of the buildings near. This will prevent the debris from falling into the trench. The distance between each trench should not be less than 15 metres. There should be zig-zag indications of 10 metres apart showing access to the trench.

Home Trenches

Trenches may be dug in gardens of homes. Each trench should be 10′ long, $4\frac{1}{2}$′ wide at the top, $3\frac{1}{4}$′ across the bottom and 6′ deep. There is a covering at the top. The sides of the trench may be lined with bricks to prevent them collapsing. There should be a clear indication to show how to get to the trench during the emergency. There should be proper maintenance of the trench.

Sand Bags

There should be sand bags filled up three fourth. The neck should be then tied. These bags are then placed close to the building and filled there itself. These bags should be in a line

and then beaten to form a rectangular shape with their corners tucked in so that the bag does not burst at the seams. The bags are placed in the first row with neck inside and known as the "header". The "stretcher" is placed next and this is a half-filled bag. This is done alternately.

In cases where no open space is available a refuge room is prepared as follows :

1. Protection of windows and doors *blast* by putting sand or dust bags around the window.

2. Pasting of sheets of paper on all glass window panes and doors.

3. Ventilators to be protected by $\frac{1}{2}''$ wire mesh netting.

4. Dim your lights.

5. Stock of drinking water, food, first-aid kit, crowbar, shavel, rope, torch or candles to be kept ready.

6. Sanitary arrangements should be there in this refuge room.

7. Sitting or lying down can be done in the refuge room to conserve energy.

8. It is essential to remain here till the "raider passed" signal is given by the siren.

It is very essential that as soon as the Air-Raid warning is sounded, the following precautions should be observed :

1. Never run to take cover if there is no time but lie flat on the ground with you face down.

2. Keep your chest raised by resting on your elbows.

3. Plug your ears with cotton or any avilable cloths.

4. Keep a piece of cloth between the teeth to keep the mouth open so that the tongue is not cut due to vibrations in the earth.

5. Never look up into the sky during an air raid.

6. Debris and splinters fly in all directions ; therefore roll yourself or fold in the ground.

7. If you are near a building, stand close to it but do not lean against the walls.

8. If inside a building, it is better to be near an inner wall rather than an outer wall or a window. The best position is in the angle of a wall.

9. If an air raid occurs whilst travelling in a train then turn off lights and take cover under the seat and avoid looking out of the window.

10. If in bus stop it and leave it and if in a car, stop it on the left hand close to the edge of the road and leave it unlocked so that if you are a casualty it may be driven by somebody else. Keep the windows open. Getting out of the car and being in the open is the best thing to be done.

11. If the raid occurs when you are seeing a movie, stay inside the picture hall for it is safer there than outside. If you are in an animal driven vehicle, tie the animals to a nearest tree or pole to prevent obstruction of traffic. Then go out and act as if in the open.

12. Animals like sheep, goats, cattle should be kept in the nearest enclosure.

13. If an air raid warning occurs at home take shelter in the trench, refuge room etc.

The Civil Defence organisation has its duty for preparing for an emergency. During the time of war it should give necessary information, protection to people and their property and also help in the alleviation of human suffering. People can join this organisation voluntarily. They can help the Home Guards and Police in Traffic Control, maintain law and order, work at community centres and hospitals, help in removal of causalties or do any other duty required. The other Civil Defence organisations are th Woman's Voluntary Services, St. John's Ambulance Association and the Indian Red Cross Society. This knowledge gained by one is not only useful during war time but also in civil life in order to help someone during an emergency.

Summary

In Civil Defence every citizen joins hands voluntarily in a collective effort to protect himself and his neighbours and to keep the community life going as best as possible. The organisation helps to save life, decrease danger to property, helps in the continuity of production and to keep up the morale of the people during dangerous moments. Many problems arise during a total war such as loss of life, injuries, epidemics, fires, damage to property, panic, homeless people and unexploded bombs. The Civil Defence, therefore requires the help of other services like the Red Cross Society, National Cadet Corps, Home Guards, Medical and Health Services, Welfare Services, etc. Thus the Civil Defence Department of any country helps to minimise the suffering involved in the use of Gas, High Explosive and Nuclear Warfare. In this manner the hazards of Radiation Sickness are minimised by a volunteer knowing how to identify the different types of gases used in Chemical warfare. The giving of immediate *first aid* and *labelling* the various casualties in the war may enable one to save as many lives as possible. Exposure to open warfare can cause civilians either the loss of life or physical and mental suffering. In case of aerial warfare people can be protected by air raid warnings, digging of trenches, building shelters, use of sand bags etc. This will all eviate suffering.

Things to do

1. List out the risks involved during a total war.

2. Find out what makes a fire.

3. What do you understand by Fire Risk ? Find this out.

4. Find out whether your school has fire-fighting equipment and if so what does it consist of ?

5. List out the various types of Fire Extinguishers.

Fill in the blanks :

1. A citizen joins the Civil Defence organisation.....

2. Military operations are carried out either for.....or for.....

3. Chemical warfare consists of the use of.....and.....gases.

4. Gamma Radiation effects are.....

5. In Biological Warfare....., ... and.....are used.

Discussion Quesstion

1. Trenches are a source of protection against Nuclear Warfare.

2. It is criminal to explode High Explosive and Nuclear Devices.

3. Modern Warfare results in Psychological warfare.

It is with united effort that good deeds can be done.

—Atharva Veda

CHAPTER 23

World Health Organization ; UNICEF ; FAO ; C.A.R.E.

International Health

The presence of preventable disease and low health standards anywhere in the world represents a danger for all countries and an obstacle to world peace. Realizing this truth, the nations of the world met together 32 years ago to set up a world co-operative for health, the *World Health Organization,* and to endow it with a Constitution which is the most enlightened and far-sighted Charter of Health that the world has ever known.

The World Health Organization came into official existence on April 7, 1948 with the signing of its constitution by the representatives of 61 nations. It is an agency of United Nations with its headquarters at Geneva in Switzerland *i.e.*, Palais des Nations for the purpose of co-ordinating and directing international health work. Its objective is to work for the attianment of the highest level of health by all people.

With the formation of the W.H.O., for the first time in history, the people of the world have in their service an

Fig. 23.1—Members of the WHO giving help to the sick

organization with the authority and the means to direct and co-ordinate international health work.

It has been realized that the health of all people is fundamental to the attainment of peace and security and is dependent upon the fullest co-operation of individuals and States all over the world. Further, unequal development in different countries in the promotion of health and control of diseases especially communicable diseases, is a common danger. So an international agency must work to prevent disease spreading from one country to another and also provide health protection to all.

W.H.O.'s mandate from its member countries is to reduce sickness and raise health levels by stimulating and supporting preventive action as well as curative, and protecting populations against communicable disease and the ills due to insanitary conditions, unsafe water, wrong food, lack of health care. It is also concerned with problems that are particularly serious in highly industrialized countries, cancer, cardio-vascular diseases, mental health and the dangers from ionizing radiation.

Problems to be given priority are malaria, tuberculosis, venereal diseases, maternal and child health, nutritional and environmental sanitation. World Health Organization is organized to furnish medical facilities to member nations to collect the world-wide statistics, to serve as central clearing house for a rapid exchange epidemiological information, to eradicate epidemic and endemic diseases, to encourage and conduct scientific research, to disseminate medical information and to assist in the medical development of an informed public opinion on matters of health It is also concerned with the standardisation of drugs, biological preparations, diagnostic procedures and nomenclature with respect to disease and causes of death.

The world has been divided into six regions for administrative purposes of the W.H.O.

(1) South East Asian countries *i.e.*,

India, Ceylon, Nepal, Burma, Thailand Indonesia and Afghanistan.

The headquarters of this region are at New Delhi.

(2) America.

(3) Europe.

(4) East Mediterranean Muslim Countries including Pakistan.

(5) Western Pacific Countries.

(6) Africa.

Finances of World Health Organization

The various member countries make voluntary contributions towards the funding of the W.H.O. They contribute according to their ability to pay but get aid according to their requirements. There are certain conditions attached to this aid given by the W.H.O. Projects for which aid is given must be for the country as a whole and the State Government concerned must be able to continue them even when the aid is withdrawn after three years. Aid is given in the form of technical expert personnel who work for a fixed period along with the local health authorities in specific health programmes of the government. The equipment and supplies for the projects may be provided by the UNICEF or the W.H.O. itself or the Government of the respective countries concerned.

Between 1948 and 1968 W.H.O. gave assistance to 150 health projects in India. Also a number of W.H.O. visiting professors were assigned to 20 medical colleges and other teaching centres to help them in setting up new departments like pharmacology, pediatrics, social and preventive medicine etc. or to reorganize the existing ones. The W.H.O. has also helped in the training of nurses, midwives, health visitors, sanitary inspectors laboratory assistants etc.

World Health Day

The 7th April each year is celebrated as the World Health Day to comemorate the signing of the W.H.O. Constitution. This day is utilized to interest people in health needs and to stimulate them to co-operate in the national and international health programmes.

United Nations International Children's Emergency Fund (UNICEF)

This fund was started on 11th December 1946, after the Second World War. It is a subsidiary body of the General Assembly reporting to the Economic and Social Council. Since 1950 the Fund is applicable to all underdeveloped countries. It is now called the 'United Nations Children's, Fund but the abbreviation UNICEF is still used.

It has 90 member countries and it gives aid to all nations irrespective of race, colour and political belief. For administrative purposes of the Fund, the whole world is divided into four regions *viz.*

(1) Asia with its headquarters at Bangkok.

(2) America

(3) United Kingdom and Africa.

(4) Europe, Eastern Mediterranean Countries and France.

Aid is given for projects which promote the health of the mothers and children and for those that prevent disease. Till the year 1954 about 80 million children of the world derived benefit from this fund in some form or the other.

The funds of UNICEF come from voluntary contributions both through Governmental and private sources. The fund is administered by an Executive Director under policies laid down by its 30-nation Executive Board. The importance of the contribution made by this Fund towards the welfare of children can be judged from the fact that there are approximately 1,000,000,000 children in the world. The majority (75%) of them live in economically underdeveloped areas where poverty, hunger and disease are widespread and most children lack adequate food, clothing and protection.

At the present moment, UNICEF aid is being given to 393 projects in some 104 countries and territories of the world. Every type of UNICEF assistance has its basic purpose the improvement of maternal and child welfare. In India the various types of aided programmes represent different approaches to this objective. UNICEF aid falls into five major categeries :

1. Basic maternal and child health services which include networks of permanent health centres and training of national personnel to plan and operate these services. So far UNICEF has provided equipment and material for 1286 primary health centres and 3220 sub-centres as well as for 163 hospitals and 111 laboratories which support them. It has also provided vehicles to enable the staff of the primary health centres and the district health teams, to travel around their districts while performing their duties.

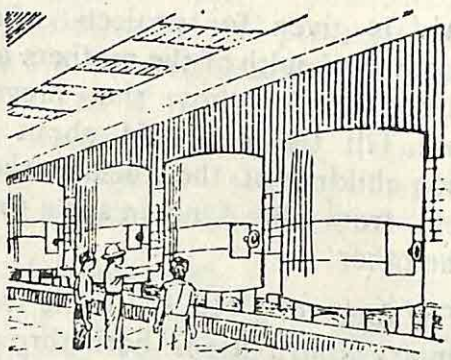
(2) Disease control which includes campaigns to control or eradicate diseases such as malaria, tuberculosis yaws, trachoma and leprosy affecting large number of children.

UNICEF has given aid in the form of personnel and material for the well-known B.C.G. campaign, venereal diseases control programme, yaws control programme in the hilly districts of Madhya Pradesh, Hydrabad and Andhra Pradesh, installation of a penicillin factory near Poona (Pimpri) and a D.D.T. factory near Delhi.

(3) Nutrition, which includes supplementary child-feeding schemes, milk conservation and the development of other protein-rich foods as well as the education of families in better nutrition practices.

UNICEF has given aid for the setting up of a dairy plant at Bombay for provision of dried Skimmed milk to needy children. Further with the objective of stimulating and expanding the use of edible ground nut cake and flour as a means of improving the nutritional content of diet of low income groups, UNICEF is providing

Members of the UNICEF giving help to poor children



A Modern Milk plant set-up with the help of UNICEF.

Fig. 23.2

equipment for commercial oil extraction and producing protein-rich flour.

(4) Social services for children including the teaching of home craft and mothercraft.

(5) Emergency aid for the relief of mothers in the time of disaster such as earthquakes, flood, droght and famine.

UNICEF has also played an important role in the adoption of the Declaration of the Rights of the Child by the United Nations General Assembly on November 20, 1959.

This Declaration reads as under :

By the present Declaration of the Rights of the Child commonly known as the "Declaration of Geneva", men and women of all nations recognizing that Mankind owes to the Child the best that it has to give, declare and accept it as their duty to meet this obligation in all respects

(*a*) THE CHILD must be protected beyond and above all considerations of race, nationality or creed.

(*b*) THE CHILD must be cared for with due respect for the family as an entity.

(*c*) THE CHILD must be given the means requisite for its normal development materially, morally and spiritually.

(*d*) THE CHILD that is hungry must be fed ; the child that is sick must be nursed ; the child that is physically or mentally handicapped must be helped ; the maladjusted child must be re-educated ; the orphan and the waif must be sheltered and succoured.

(*e*) THE CHILD must be the first to receive relief in time of distress.

(*f*) THE CHILD must enjoy the full benefits provided by social welfare and social security schemes ; the child must receive a training which will enable it, at the right time, to earn a livelihood and must be protected against every form of exploitation.

(*g*) THE CHILD must be brought up in the consciousness that its talents must be devoted to the service of its fellowmen

Another action which has awakened public consciousness towards the child is *Universal Children Day*, which has been celebrated since 1953 all over the world and which for the past few years has been organized in co-operation with UNICEF.

In India Children's day is celebrated on 14th November every year to coincide with Pandit Nehru's birthday.

Food and Agriculture Organization (FAO)

The Food and Agriculture Organization of the United Nations (FAO) is one of the oldest of the UN Agencies. It was established on 16th October, 1945 by the delegates of 42 countries who met at Quebec, Canada for this purpose. Today FAO has a membership of 125 Member Nations.

The Organization is governed by the Conference of FAO which meets every alternate year and sets the policy, determines the scale of countributions from Member Nations and decides the programme of work and formulates the budget for the ensuing two years. It also elects the Director General.

The Organization has an international staff of more than 6000 of which more then 3000 are professionals. Besides its own budget, FAO uses funds channelled through the

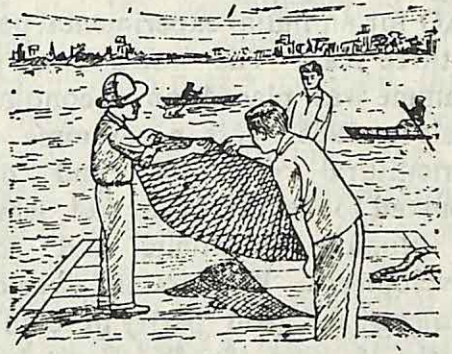


Fig. 23.3—Providing new methods of fishing

UNDP to send technicians to the developing countries. FAO has its Headquarters in Rome, Italy. The chief aims of the FAO are to help nations raise the standard of living, to improve nutrition of the people of all countries, to increase the efficiency of farming, forestry and fisheries ; to better the condition of the rural people and through all these means to widen the opportunity of all people for productive work.

FAO's work in India covers a wide variety of activities—technical assistance in fisheries, forestry, nutrition, animal husbandry, poultry, irrigation, soil and water management, horticulture, dairying, seed production, etc.

FAO's field work is supported by other sources like the Freedom from Hunger Campaign and the World Food Programme. The Freedom from Hunger Campaign was started by FOA in January 1960 and has contributed 20 million dollars to projects in developing countries.

World Food Programme

This was established in 1963 under

the joint auspices of the U.N. and the FAO for an initial experimental period of three years. The world Food programme was placed on a continuing basis in 1965. This programme uses agricultural surpluses and other donated foodstuffs, cash and service to promote economic and social development. Workers in developed projects are paid partly in cash and partly in kind (food). Food is also used to relieve emergency shortages caused by floods, volcanic cruptions and other disasters. In 1970-71 300 million dollars worth of food, cash and services were offered towards relief work.

C.A.R.E. (Co-operative for American Relief Everywhere)

CARE is a non-profit, non-sectarian and non-governmental organization which was created in 1946 for the immediate purpose of sending food from American donors to people of war-devastated Europe. Later its programmes were extended to other countries and to other kinds of aid, besides food.

Today, CARE missions in 27 countries are not only supplying food packages and food in bulk, they are also distributing more than one hundred CARE "kits", which contain materials and tools to be used in vocation training, agriculture, health and education programmes. In addition, CARE is providing textile and amenity packages for displaced people as well as an increasing number of specially purchased items which meet specific needs of community development.

CARE also provides medical supplies, hospital instruments, artificial limbs, drugs and antibiotics, mobile Health Units, etc.

CARE book programmes also play an important role in advancing public hygiene. Nationals undergoing training for health service in their countries read books chosen from CARE'S notable medical, scientific and technical bibliography and send to their health agencies and other institutions. CARE also lends a hand in medical education by sending a large number of scientific and medical books to medical colleges and university libraries

CARE also sends equipment to the disabled in war-torn countries and has helped introduce techniques of rehabilitation perfected in the west in developing areas.

CARE essentially encourages self-help programmes of all kinds in developing countries.

International health measures to check the spread of communicable diseases from one country to another.

We are living in the jet age ; so with such swift means of transport there is a great danger of travellers' spreading diseases from one country to another. Amongst the diseases that can be spread in this way are smallpox, cholera, plague and yellow fever.

All countries in the world observe the international quarantine regulations. This means compulsory isolation at the port of entry of all persons coming from an infected place or persons who have been in contact with the case of an infectious disease, against which quarantine has been imposed *e.g.*, 14 days for smallpox, 5 days for cholera, 6 days for plague and 9 days for yellow fever.

In India International Quarantine is a Central subject and so health administration at the six major ports, *viz.*, Calcutta, Visakhapatnam, Madras, Cochin, Bombay and Kandla and at five international airports *viz.* Bombay (Santa Cruz), Calcutta (Dum Dum), Madras (Meenambakkam), Tiruchirapalli and Delhi (Palam) is directly controlled by the Director General of Health Services.

The quarantine administration at the minor ports has been delegated to the respective State Governments.

By mutual agreement, no quarantine restrictions are applicable to traffic between India and Pakistan or between India and Nepal. Arrangements have been made for the establishment of check-posts on the main traffic routes between India and Tibet during times of epidemics.

Special Precautions

Increasing Communication with neighbouring yellow fever-infected territories in Africa, faster sea and air traffic, favourable meteorological and other conditions for the growth and sustenance of Aaedes Aegypti mosquitoes and the susceptibility of men, monkeys and mosquitoes to yellow fever infection pose a constant threat to India from this disease. Special precautions are, therefore, taken to prevent its entry into India through aerial or maritime traffic. All aircraft entering into India from the west are disinfected as a routine measure, if not already disinfected at Karachi airport.

All persons arriving within nine days of their departure from yellow fever-infected area without valid certificate of vaccination against yellow fever are detained in quarantine for appropriate period. Mosquito-proof isolation hospitals have been provided at the international airports of Bombay, Calcutta, Madras and Tiruchirapalli. Delhi airport also has emergency quarantine arrangements for two persons.

There are arrangements with the Government of Pakistan to detain international passengers in transit who are at risk to yellow fever at Karachi unless they are proceeding in the same international aircraft to Bombay or Calcutta airports where proper arrangements for their isolation are available.

Since monkeys are a reservoir of yellow fever infection, they are not permitted to be brought into India unless covered by a certificate from the Government authority of the country of shipment declaring that monkeys had not been to any yellow fever infected area within 31 days of shipment.

To make our ports and airports non-receptive to quarantinable diseases, intensive anti-mosquito, anti-rodent and other sanitary measures are taken in all the major ports and international airports. Also personnel coming in contact with international traffic are protected against the diseases.

The W.H.O. is constantly trying to make international travel safer and easier. The old regulations, with their emphasis on quarantine, were replaced by the International Health Regulations 1969 that encourage the use of modern public health methods to stop the spread of dangerous diseases. Under these regulations, all persons intending to travel abroad have to be vaccinated against smallpox and inoculated against cholera. Further, those coming from or going to plague or yellow fever infested areas have to be protected against these diseases also. All passengers must carry their International Health Certificate with them duly endorsed by appropriate health authorities to confirm that they have been protected against these diseases. These certificates are checked along with the passports before the passengers are allowed to enter any country.

Summary

International health programme is a co-operative effort on the part of the nations of the world. The World Health Organization is a world co-operative for health. It is an agency of the United Nations established in April 1948 for the purpose of co-ordinating and directing international health work. It has its head-quarters at Geneva. It aims at reducing sickness and raising the health levels of the people of the world. It also plays a vital role in the eradication of disease.

World Health Day is celebrated all over the world on the 7th of April each year. The United Nations International Children's Emergency Fund (UNICEF) was started in December 1946. It gives aid for projects which promote the health af the mothers and childern and for those that prevent disease. UNICEF has also played an important role in the adoption of the Declaration of the Rights of the child by the United Nations General Assembly on November 20, 1959.

The Food and Agriculture Organization is one of the oldest agencies of the United Nations. It was established in 1945 with its Head quarters at Rome, Italy. It helps nations to obtain better and more products from their farms, forests and fisheries. It also advises governments on how to improve their agriculture and works to improve the diets of the people throughout the world.

C.A.R.E. is a non-profit, non-sectarian and non-governmental organization which was created in 1946 for sending food from America to the people of war-devastated Europe. Later its programmes were extended to other countries and to other kinds of aid besides food.

All countries in the world observed the International quarantine regulations in order to check the spread of diseases like yellow fever, cholera, small pox and plague from one country to another through the travelling public. The International Health Regulations passed in 1969 make it obligatory for all international passengers to be vaccinated against small pox and inoculated against Cholera. Protection against yellow fever and plague is also required for visiting certain countries.

I. Essay Type and Short Answer Questions

1. What is the role of World Health Organization in promoting health ?

2. Explain the part played by UNICEF in ensuring maternal and child welfare across the world.

3. In what ways have FAO and C.A.R.E. helped people in developing countries ?

4. What are some of the dangers of international travel in terms of world health ?

5. What measures are taken to prevent the entry of Yellow fever into India ?

II. Objective Type Questions

(*a*) Fill in the blanks :

1. The World Health Organisation is endowed with a.....and.....of health.

2. The World Health Organisation came into official existence on.....and its constitution was signed by representatives of..... .....nations.

3. The W.H.O. is an agency of the..... Nations with its headquarters at.....

4. The work of W.H.O. is to deal with problems of health mostly in.....countries of the.....

5. World Health Day is celebrated on..... each year.

6. United Nations International..... fund was started on.....

7. The UNICEF has 90 member countries and it gives aid to all nations irrespective of race.....and.....belief.

8. The funds of UNICEF come from..... contributions both through Government and .....sources.

9. This fund is used for the welfare of... .....from poverty, hunger and.....

10. In India the Children's Day is celebrated on.....every year to coincide with Pandit Nehru's.....

(*b*) *True-False* : Mark (√) for the true statements ; mark (×) for false statements.

1. The Food and Agriculture Organisation is one of the oldest organisations of the United Nations.

2. The FAO has its Headquarters in Rome, Italy.

3. The chief aims of the FAO is to raise standards of living.

4. The World Food Programme is a great aid to those in suffering.

5. CARE is a non-profit, non-sectarian and non-government organisation.

6. International health measures check the spread of communicable diseases from one country to another.

7. Quarantine is not imposed at all ports for health reasons.

8. Yellow fever infection does not pose a constant threat to India from Africa.

9. Yellow Fever is spread through the bite of the mosquito called Aedes Egypti.

10. Vaccination is not required for Yellow Fever.

Activities

1. Prepare posters to depict the role of WHO, UNICEF, FAO and C.A.R.E.

2. Make a chart giving the main points of the "Declaration of the Rights of the Child".

3. Make suitable preparations for celebrating the World Health Day and Universal Children's Day in your school.

APPENDIX I

"Something to think of"

1. One should eat to live and not live to eat. —*Franklin*

2. Feed by measure and defy the physician. —*John Hey Wood*

3. Go to your banquet then, but use delight. So as to rise still with an appetite. —*R. Herrick*

4. The first great gift we can bestow on others is a good example. —*Morel*

5. Example is a lesson that all men can read. —*Gilbert West*

6. Learn from the beasts the physic of the field. —*Pope*

7. The best of all medicines is rest and fasting. —*Franklin*

8. Use three physicians first Doctor Quiet, then Doctor Merryman and then Doctor Diet. —*Proverb*

9. Temperance and labour are the two best Physicians ; one prevents indulgence to excess and the other sharpens the appetite.

10. Habit is either the best of servants or the worst of masters.

11. Strike whilst the iron is hot. —*Proverb*

12. Coming together is beginning, keeping together is progress, working together is success. —*Henry Ford*

APPENDIX II

"Controlling weight is more than counting calories." Avoid cutting out basic foods when reducing calories. "Eat wisely whilst eating less".

CALORIES IN COMMON FOODS

I. Dairy Foods

S. No.	*Kinds of Food*	*Serving*	*Calories*
1.	Butter	1 tablespoon	95
2.	Cottage Cheese (Panir)	½ tea cup	100
3.	Cream Cheese	1 ounce	105
4.	Cream Coffee	2 tablespoons	65
5.	Coffee half and half	1 cup	160
6.	Whole Milk	1 glass	170
	Toned Milk	1 glass	85
	Butter Milk (Lassi)	1 glass	85

S. No.	Kinds of Food	Serving	Calories
7.	Ice Cream (Vanilla)	¼ quart	205
	Ice Cream (Chocolate)	¼ quart	240
II. Vegetables			
1.	Cabbage	½ cup	15
2.	Carrot	1 medium	25
3.	Cucumber	½ medium	10
4.	Lettuce	¼ head	10
5.	Lettuce Green	1 large leaf	10
6.	Onion (Green)	1 medium	5
7.	Reddish	1 medium	2
8.	Tomato	1 medium	25
9.	Beetroot	½ cup	40
10.	Carrots	½ cup	25
11.	Cauliflower	½ cup	25
12.	Corn	1 medium ear	100
13.	Onions	1 large	50
14.	Potato	1 small	85
15.	Sweet Potato	½ large	100
16.	Pumpkin	½ cup	40
III. Fruits			
1.	Fresh Apple	1 large	100
2.	Apricot Fresh	3 medium	60
	Apricot Dried	5 halves	90
	Apricot Canned	6 halves	90
3.	Banana	1 medium	100
4.	Melon	½ medium	35
5.	Cherries Sweet	15 large	80
6.	Dates Dried	3—4	95
7.	Pear Fresh	1 medium	70
8.	Pear Canned	2 halves	75
9.	Pineapple	¾ halves slice	60
10.	Prunes	4-5 medium	150
11.	Raisins	¼ cup	90
12.	Raspberries	½ cup	45
13.	Strawberries	10 large	40
14.	Water Melon	Medium serving	100
15.	Grape Fruit	½ small	45

S. No.	Kinds of Food	Serving	Calories
IV.	**Fruit Juices**		
1.	Mixed Fruit	½ cup	80
2.	Grape Fruit	½ cup	45
3.	Lemon	1 tablespoon	5
4.	Orange	1 tablespoon	5
V.	**Breads**		
1.	Bread	1 oz. slice	75
		Thin slice	50
2.	Biscuits (sweet)	2 small	100
3,	Cream Cracker Biscuits	2 small square	20
VI.	**Cereals**		
1.	Rice cooked	½ cup	75
2.	Wheat cooked	½ cup	75
VII.	**Meat and Poultry**		
1.	Meat cooked	Medium serving	
	Meat lean	3½ ozs.	175
	Meat fat	3½ ozs.	270
2.	Bacon, crisp	3 strips	100
3.	Fish average	Medium serving	200
	Fish lean	Medium serving	100
4.	Oysters	4—6	50
5.	Shrimps (small prawns canned)	5—8	50
6.	Chicken	Medium serving	175
7.	Eggs whole	1 medium	80
	Eggs fried	1 medium	100
	Eggs poached	1 medium	80
	Eggs scrambled	1 medium	130
VIII.	**Miscellaneous**		
1.	Pizza, cheese and tomato	⅙ of 12″ diameter	260
	Sausages	⅙ of 12″ diameter	300
	With everything	⅙ of 12″ diameter	500
2.	Sugar	1 tablespoon	50
3.	Jam, Jelly	1 tablespoon	60
4.	Honey	1 tablespoon	60
IX.	**Soft Drinks**		
1.	Ginger ale	1 glass	85

S. No.	Kinds of Food	Serving	Calories
2.	Lemonade or lime juice	1 glass	115
3.	Limca, Fanta etc.	1 bottle	80
X. Alcoholic Drinks			
1.	Beer	1 glass	105
2.	Brandy	1½ ozs.	105
3.	Gin	1½ ozs.	105
4.	Scotch Whisky	1½ ozs.	120
5.	Wine	3½ ozs.	90
6.	Sherry	3½ ozs.	140
7.	Port	3½ ozs.	160
XI. Sandwiches			
1.	Chicken salad	1	245
2.	Cheese with 1 slice bread	1	215
3.	Egg salad	1	290
4.	Ham	1	270
5.	Lettuce-tomato	1	240
6.	Peanut butter	1	300
XII. Cheese Dishes			
1.	Macaroni and Cheese	¾ cup	280
2.	Souffle	¾ cup	150
XIII. Lentils and Nuts			
1.	Beans fresh	½ cup	130
2.	Beans dried	½ cup	100
3.	Peanut Butter	1 tablespoon	100
4.	Peanuts	¼ oz.	45
5.	Walnuts	¼ oz.	50
XIV. Desserts			
1.	Plain cake	2½" square	220
2.	Iced cake	2½" square	300
3.	Sponge cake	Medium piece	150
4.	Chocolate eclair	1 medium	250
5.	Cream puff filled	1 medium	175
6.	Rice Pudding (Khir)	½ cup	135
XV. Soups			
1.	Bean or Dhall	1 cup	220
2.	Tomato	¾ cup	80

S. No.	Kinds of food	Serving	Calories
3.	Bouillon	¾ cup	20
4.	Vegetable	¾ cup	85
5.	Cream	¾ cup	200
XVI.	**Miscellaneous**		
1.	Chocolate cream	1 piece	50
2.	Cocoa, all milk	1 cup	165
3.	Coconut, dried	2 tablespoon	85
4.	Coconut oil	1 tablespoon	100
5.	Flour	1 tablespoon	30

APPENDIX III

Test for Proteins

1. Biuret test. To 3 ml. of 5% NaOH solution, add 2 drops of 1% copper sulphate solution. Mix thoroughly. Add this solution to the solution of the food to be tested.

The appearance of a violet colour indicates the presence of protein. (Egg albumen usually gives a reddish tinge while degraded protein may give a pink or mauve colour).

2. Xanthoproteic Test. To 3 ml. of the food solution, add 1—2 ml. concentrated HNO_3 and heat.

The appearance of a yellow ppt. indicates the presence of protein.

Cool, dilute with water and add excess of ammonia solution very slowly. The change of colour to orange further confirms the presence of protein.

Tests for Reducing Sugars

Fehling's Test. Add together equal quantities ot Fehling's solution A and B and pour some of the mixture into a test tube. Add an equal volume of the food solution to be tested to this and heat test tube in a water bath. Observe the colour changes in the test tube. The appearance of an orange or brick ppt. indicates the presence of a reducing sugar.

Benedict's Test

To 5 ml. of Benedict's solution. add 8—10 drops of the solution to be tested. Boil for two minutes. A red or yellow ppt. indicates the presence of sugar.

This test is used for testing the urine of patients suffering from diabetes to assess the amount of sugar present in a semi-quantitative way. The appearance of greenish tinge indicates traces of sugar, while a brick red ppt. indicates over 2% sugar.

Test for Non-Reducing Sugars

A non-reducing sugar, such as sucrose in cane sugar, will not react with Fehling's solution as above, but will only do so if the sugar is first boiled with dilute HCl and then made alkaline with NaOH. This is because the acid first breaks down or hydrolyses the complex sugar sucrose into two simple sugars as follows :

Sucrose on hydrolysis = glucose + fructose.

Test 1. Add a few drops of dilute HCl to the solution and boil gently for a minute or so Neutralize the HCl with NaOH or Na_2CO_3 until no further effervescence occurs.

Then test with Benedict's or

Fehling's solution for the presence of glucose.

Test 2 for Cane Sugar. To a small quantity of the solution add 1-2 ml. of 5% solution of cobalt nitrate followed by a small quantity of a strong solution of NaOH (40%).

A violet colour reaction is a positive test for cane sugar (5% cobalt nitrate solution is prepared by adding 5 grams of cobalt nitrate to 100 ml. of distilled water ; and a strong solution of NaOH by adding 50 grams of NaOH sticks to 100 ml. of distilled water.)

Iodine Test. Acidify the unknown solution with a drop of HCl. Add 1 drop of this solution to a solution of Iodine in potassium iodide. Note the colour.

Blue colour indicates starch (polysaccharide). Red colour indicates disacharide or erythrodextrin.

Test for Starch

Add a small quantity of aqueous iodine solution (iodine dissolved in KI solution) to a slice of the food or solution of the food to be tested.

The appearance of a bule-black colour indicates the presence of Starch.

Fats or Lipids

Neutral fat in common with most lipids is very difficult to characterise by ordinary methods. The following are a few simple tests for fats. (*a*) Fat is soluble in organic solvents. Extract fat from the food to be tested by shaking material with 1 ml. each of :

1. Chloroform
2. Ether
3. Chloroform Ethanol Mixture (2 : 1)

Pour in separate test tubes onto water in separate petridishes. Dip a glass rod into each test tube containing extract and put a spot on a piece of paper. The paper is reduced translucent indicating the presence of fat.

(*b*) Add a small quantity of Sudan III to the extract. The appearance of pink droplets floating on top indicates the presence of fat.

(*c*) Crush the food to be tested and rub it on a piece of filter paper. If a translucent patch develops on the paper (which is best seen by holding the paper up to the light) then the food contains fat.